
VALIDATION REPORT

“CHANGNING KAWAN 18.9MW HYDROELECTRIC PROJECT”

IN CHINA

REPORT No. 0081

VERSION No. 02

VALIDATION REPORT

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Approved by: Hiroshi Inanaga	Organisational unit: Deloitte Tohmatsu Evaluation Certification Organization
Client: Mitsubishi Corporation	Client ref.:
<p>Summary:</p> <p>Deloitte Tohmatsu Evaluation Certification Organization (Deloitte-TECO) has performed a validation of the “Changning Kawan 18.9MW Hydroelectric Project” in China, to confirm whether or not it has met the UNFCCC criteria for the CDM, as well as the criteria required for consistent project operations, monitoring and reporting. The abovementioned UNFCCC criteria refer to Article 12 of the Kyoto Protocol, CDM modalities and procedures, as well as subsequent decisions by the CDM Executive Board. This validation report summarizes the findings of the validation Deloitte-TECO team.</p> <p>The validation process covered three phases: i) a review of the project design documents, ii) follow-up interviews with project stakeholders and iii) a resolution of outstanding issues and the issuance of the final validation report and opinion.</p> <p>In summary, it is Deloitte-TECO’s opinion that the project, as described in the project design document of 22 June 2009 (version 05), meets all relevant UNFCCC requirements for the CDM and correctly applies the approved baseline and monitoring methodology of ACM0002 ver. 08. Deloitte-TECO requests that the “Changning Kawan 18.9MW Hydroelectric Project” in China be registered as a CDM project activity.</p>	

Report No.:	Subject Group: Environment	
Report title: “Changning Kawan 18.9MW Hydroelectric Project”, in China		
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Indexing terms

Climate Change, Kyoto Protocol, Validation, Clean Development Mechanism

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VALIDATION REPORT

Abbreviations

BM	Build Margin
CAR	Corrective Action Request
CDM	Clean Development Mechanism
CEF	Carbon Emission Factor
CER	Certified Emission Reduction
CL	Clarification Request
CM	Combined Margin
CO ₂	Carbon Dioxide
CO ₂ e	Carbon Dioxide Equivalent
DNA	Designated National Authority
DOE	Designated Operational Entity
GHG	Greenhouse Gas(es)
GSC	Global Stakeholder Consultation
GWP	Global Warming Potential
IPCC	Intergovernmental Panel on Climate Change
LOA	Letter of Approval
MP	Monitoring Plan
NDRC	National Development and Reform Commission
NGO	Non-governmental Organisation
ODA	Official Development Assistance
OM	Operational Margin
PDD	Project Design Document
PP	Project Participants
SCPG	South China Power Grid
UNFCCC	United Nations Framework Convention on Climate Change

 VALIDATION REPORT

Table of Contents	Page
1 INTRODUCTION	4
1.1 Objective	4
1.2 Scope	4
1.3 GHG Project Description	4
2 METHODOLOGY	5
2.1 Review of Documents	7
2.2 Follow-up Interviews	8
2.3 Resolution of Clarification and Corrective Action Requests	9
3 VALIDATION FINDINGS	9
3.1 Approval by DNA	9
3.1.1 Confirmation of Ratification	10
3.1.2 Confirmation of DNA	10
3.2 Project Participants	10
3.2.1 ODA Additionality	10
3.3 Project Design	10
3.3.1 Chronological table of key events	10
3.3.2 Technology used	11
3.3.3 The project's contribution to sustainable development	12
3.3.4 PDD compliance	12
3.3.5 Project duration and crediting time	12
3.4 Project Boundaries	12
3.4.1 Appropriateness of project boundaries	12
3.5 Baseline	13
3.5.1 Approval of baseline methodology	13
3.5.2 Correct application and justification of selected baseline methodology and the project's environmental additionality	14
3.6 Algorithm/Formulae Used to Determine Emission Reduction, and Calculation of GHG Emissions	14
3.7 Additionality of project activity	16
3.7.1 Prior consideration of the clean development mechanism	16
3.7.2 Identification of Alternatives	17
3.7.3 Investment analysis	17
3.7.4 Barrier analysis	20
3.7.5 Common practice analysis	20
3.8 Monitoring Plan	22
3.8.1 Collecting data and reporting	22
3.8.2 Monitoring system	22
3.9 Sustainable development	23

VALIDATION REPORT

3.10	Environmental Impacts	23
3.11	Comments by Local Stakeholders	23
4	COMMENTS BY PARTIES, STAKEHOLDERS AND NGOS	23
5	VALIDATION OPINION	24
6	VALIDATION TEAM	25
6.1	Team	25
6.2	Internal Quality Control	25
7	REFERENCES.....	26

Appendix A: Validation Protocol

Appendix B: Qualification

VALIDATION REPORT

1 INTRODUCTION

1.1 Objective

Mitsubishi Corporation has commissioned Deloitte Tohmatsu Evaluation Certification Organization (Deloitte-TECO) to validate the “Changning Kawan 18.9MW Hydroelectric Project” in China (hereafter called “the project”). The purpose of a validation is to conduct an independent third party assessment on the project design. In particular, the project's baseline, the monitoring plan (MP), and the project's compliance with relevant UNFCCC and host country criteria are validated in order to confirm that the project design as documented is sound and reasonable and meets the stated requirements and identified criteria. Validation is a requirement for all CDM projects and is seen as necessary to provide assurance to stakeholders on the quality of the project and its intended generation of certified emission reductions (CERs). UNFCCC criteria refer to the Kyoto Protocol criteria and the CDM rules and modalities as agreed in the Bonn Agreement and the Marrakesh Accords.

1.2 Scope

The validation scope is defined as an independent and objective review of the project design document, the project's baseline study and monitoring plan and other relevant documents. The information in these documents is reviewed against the Kyoto Protocol requirements, UNFCCC rules and associated interpretations. Deloitte-TECO has, based on the recommendations in the Validation and Verification Manual, employed a risk-based approach in the validation process, focusing on the identification of significant risks to project implementation and the generation of CERs.

While validation is a third party exercise that is completely distinct from consulting, stated requests for clarifications and/or corrective actions may provide input for improvement of the project design. The validation process applied the CDM ACM0002 ver. 08 monitoring methodology and included a review of the following documents:

- Project Design Document
- Feasibility Study Report
- Environmental Impact Assessment
- Summary of Comments by Local Stakeholders

1.3 GHG Project Description

- Project:
“Changning Kawan 18.9MW Hydroelectric Project”
Title of the project was “Yunnan Kawan 18.9MW Hydroelectric Project” when it was made publicly available for the GSC. The project participants applied the Letter of Approval to Chinese DNA with “Changning Kawan 18.9MW Hydroelectric Project”. The PP, however, applied the LOA to Japanese DNA with the title of “Yunnan Kawan 18.9MW Hydroelectric Project”. In order to correct this discrepancy, the PP decided to re-apply to Japanese DNA

VALIDATION REPORT

with the title of “Changning Kawan 18.9MW Hydroelectric Project”. Deloitte-TECO confirmed that both title of the projects are the same project.

- Name of the site:
“Changning Kawan 18.9MW Hydroelectric Project”, located in the Changning County, Baoshan City of Yunnan Province, People’s Republic of China. The Project is located along Kuke River, the tributary of the Nu Jiang River.
- Type of project:
Renewable energy connected to the national grid.
- Technology used:
This project employs a hydropower with run-of-river reservoir type a well established technology in China, consisting of one dam, intake water system including intake water sluice, intake water channels consists of channel with total length of 8,110.527 m, a pressure forebay, a penstock bifurcated into three branch pipes, tail water tunnels, a substation, and county road to facilitate the site transportation.
- Components generating GHG reductions:
The proposed project will achieve greenhouse gas (GHG) emission reductions by displacing a portion of the electricity generated by thermal power stations of the South China Power Grid (hereafter referred to as SCPG).
- Estimated amount of GHG reductions:
The annual emission reduction totals 76,131 tCO₂e.

2 METHODOLOGY

The validation process consisted of the following three phases:

- I* A desk review of the project design documentation
- II* Follow-up interviews with project stakeholders
- III* The resolution of outstanding issues and issuance of the final validation report and opinion.

In order to ensure transparency, a validation protocol was customised for the project, according to the CDM Validation and Verification Manual (VVM ver. 01 EB44). The protocol which was prepared according to the VVM shows, in a transparent manner, criteria (requirements), means of verification and the results from validating the identified criteria. The validation protocol serves the following purposes:

- It organises, details and clarifies the requirements a CDM project is expected to meet;
- It ensures a transparent validation process where the validator(s) will document how a particular requirement has been validated and the result of the validation.

The validation protocol consists of four tables. The different columns in these tables are described in Figure 1. The completed validation protocol is enclosed in Appendix A to this report.

VALIDATION REPORT

Figure1 Validation protocol tables

Table A1 Mandatory Requirements for Clean Development Mechanism (CDM) Project Activities				
Project title: Changning Kawan 18.9MW Hydroelectric Project				
ID	REQUIREMENT	REFERENCE	CONCLUSION	Cross Reference / Comment
-	The requirements the project must meet.	Gives reference to the legislation or agreement where the requirement is found.	This is either acceptable based on evidence provided (OK), a Corrective Action Request (CAR) of risk or non-compliance with stated requirements or a request for Clarification (CL) where further clarifications are needed.	Used to refer to the relevant checklist questions in Table 2 to show how the specific requirement is validated. This is to ensure a transparent determination process.

Validation Protocol Table A2: Requirement Checklist						
Project title: Changning Kawan 18.9MW Hydroelectric Project						
Means of validation	Checklist Question	Reference	Means of verification (MoV)	Draft Conclusion	Comment	Final Conclusion
Means to validate requirements of CDM VVM	The various requirements in Table 1 are linked to checklist questions the project should meet. The checklist is organised in seven different sections. Each section is then further sub-divided. The lowest level constitutes a checklist question.	Gives reference to documents where the answer to the checklist question or item is found.	Explains how conformance with the checklist question is investigated. Examples of means of verification are document review (DR) or interview (I). N/A means not applicable.	The conclusion of both the document review and the on-site assessment is stated in the section. This is either acceptable based on evidence provided (OK), or a Corrective Action Request (CAR) due to non-compliance with the checklist question (See below). Clarification (CL) is used when the validation team has identified a need for further clarification.	The section is used to elaborate and discuss the checklist question and/or the conformance to the question after the on-site assessment of the validation. It is further used to explain the conclusions reached.	The conclusion of all of validation process is stated in the section. This is either acceptable based on evidence provided (OK), or a Corrective Action Request (CAR) due to non-compliance with the checklist question (See below). Clarification (CL) is used when the validation team has identified a need for further clarification.

Validation Protocol Table A3: Resolution of Corrective Action and Clarification Requests			
Draft report clarifications and corrective action requests	Ref. to checklist question in table 2	Summary of project owner response	Validation conclusion
If the conclusions from the draft Validation are either a Corrective Action Request or a Clarification Request, these should be listed in this section.	Reference to the checklist question number in Table 2 where the Corrective Action Request or Clarification Request is explained.	The responses given by the Client or other project participants during the communications with the validation team should be summarised in this section.	This section should summarise the validation team's responses and final conclusions. The conclusions should also be included in Table 2, under "Final Conclusion".

VALIDATION REPORT

2.1 Review of Documents

The Project Design Document submitted by the client and additional background documents related to the project design and baseline were reviewed. A complete list of all documents and evidence reviewed is included in the Reference section of this document. The PDD (ver. 05) was received on 22 June 2009, after which a document review including risk analysis was conducted. The results of the risk analysis are as follows.

Risk Analysis

Risk	Verify	L/M/H	Correspondence/Action	Result
Baseline emissions	Appropriateness of emissions factor	L	Cross-check with the web information provided by Chinese government.	OK. It was confirmed that the information matched.
	Confirmation of amount of electricity generated		Accuracy of meters, $\pm 0.5\%$ must be confirmed by the evidential document.	
Leakage	Diversion of used facilities and/or equipment from other location	L	No leakage	OK
Monitoring Plan	Deficiency in data collection system	M	Preparation process must be checked with PP during validation	To be confirmed during verification.
	Deficiency in data calculation system			
Investment Cost	Consistency between Feasibility Study Report (FSR) and PDD	M	Investment cost in FSR was prepared by Design Institute of China. PDD shall be crosschecked with FSR.	It was confirmed that all data corresponded.
Internal Rate of Return (IRR) Calculation	Appropriateness of figures, factors, and calculation methods	H	IRR excel sheet shall be checked in detail.	Variation in investment cost was not reflected in sensitivity analysis.
IRR Calculation (with CER)	Appropriateness of project period applied in IRR calculation	M	IRR excel sheet was checked	21 years was applied
Starting Date of Project Activity	Selection of starting date	M	Confirmed by interview and with evidential document.	Date of permission for starting construction
Environmental Impact	Terms of license based on the result of environmental impact assessment	M	Terms of license was checked by EIA on-site.	No problems identified.
Stakeholders' Opinion	Correspondence to opinions	M	Result of stakeholders' questionnaire was confirmed in on site interviews with local residents'.	No problems identified.
Common Practice	Existence of similar projects in neighboring area	M	Seven on-going projects were identified near the project site. Investigated whether or not the project was receiving financial or policy support from the government.	It was confirmed that the project received no support from the government and was financially unattractive.

VALIDATION REPORT

2.2 Follow-up Interviews

(Ref. /6/, /30/)

During the period of 13-14 November 2008, Deloitte-TECO conducted interviews with project stakeholders to confirm selected information and to resolve issues identified in the document review. Representatives of Changning County Jia Yuan Electric Power Development Co., Ltd. and related stakeholders were interviewed. The interviewees and main topics of the interviews are summarised in Table 1 below:

Table 1 Interview Topics

Interviewed organisation	Interviewees	Interview topics
Changning County Jia Yuan Electric Power Development Co., Ltd.	➤ Xu Jiahua	➤ Overall interviews, including document review, as an important project participant
Changning County Jia Yuan Electric Power Development Co., Ltd.	➤ Yang Jianjun	➤ Overall interviews, including document review, as an important project participant
Changning County Jia Yuan Electric Power Development Co., Ltd.	➤ Zi Zhengru	➤ Overall interviews, including document review, as an important project participant
Yunnan CDM Center	➤ Wang Xiaoli	➤ Overall interviews, including document review, as a consultant
Yunnan CDM Center	➤ Xiao Hongwei	➤ Overall interviews, including document review, as a consultant
Yunnan CDM Center	➤ Zheng Li	➤ Overall interviews, including document review, as a consultant
Changning Branch of Baoshan City Electric Power Co., Ltd.	➤ Yang Guoxun	➤ Interviews regarding the specific topics on electricity demand and supply circumstance
Baoshan Development and Reform Commission	➤ Zhao Hongjiang	➤ Interviews regarding the specific topics on local administration and water demand management
Kasi Town	➤ Li Chunping	➤ Stakeholder interview, focusing on environmental impact assessment and compensation
Gantang village	➤ Wu Yongyuan	➤ Stakeholder interview, focusing on environmental impact assessment and compensation
Gantang village	➤ Zi Jinming	➤ Stakeholder interview, focusing on environmental impact assessment and compensation
Gantang village	➤ Wu Zhengtang	➤ Stakeholder interview, focusing on environmental impact assessment and compensation

The schedule for the 13-14/11/2008 on-site visit was as follows:

- 13/11/2008 On-site visit including stakeholders meeting
- 14/11/2008 Interview with project participants to check technical items, etc.

VALIDATION REPORT

2.3 Resolution of Clarification and Corrective Action Requests

The objective of this phase of the validation was to resolve the requests for corrective actions and clarification, and any other outstanding issues which needed to be clarified for Deloitte-TECO's positive conclusion on the project design. The Corrective Action Requests and Clarification Requests raised by Deloitte-TECO were resolved during communications between the client and Deloitte-TECO. To guarantee the transparency of the validation process, the concerns raised and responses given are described in the validation protocol in Appendix A.

Since modifications to the project design were necessary to resolve Deloitte-TECO's concerns, the client decided to revise and resubmit the project design document. After reviewing the revised and resubmitted project document, Deloitte-TECO issued this final validation report and opinion. After the on-site visit, Deloitte-TECO prepared a Clarification and Corrective Action Request list on 17/12/2008, and final answers from project participants were submitted to Deloitte-TECO by 30/06/2009.

3 VALIDATION FINDINGS

In the following sections, the findings of the validation are stated. The validation findings for each validation subject are presented as follows:

- 1) The findings from the desk review of the original project design documents and the findings from interviews during the follow up visit are summarised. A more detailed record of these findings can be found in the Validation Protocol in Appendix A.
- 2) Where Deloitte-TECO identified issues that needed clarification or that represented a risk to the fulfilment of the project objectives, a Clarification or Corrective Action Request, respectively, was issued. The Clarification and Corrective Action Requests are stated, where applicable, in the following sections and are further documented in the Validation Protocol in Appendix A. The validation of the project resulted in four Corrective Action Requests and sixteen Clarification Requests.
- 3) Where Clarification or Corrective Action Requests have been issued, the exchanges between the client and Deloitte-TECO to resolve these Clarification or Corrective Action Requests are summarised.
- 4) The conclusions for validation subject are presented.

The final validation findings relate to the project design as documented and described in the revised and resubmitted project design document of 22/06/2009 (ver. 05).

3.1 Approval by DNA

(Ref. /6/, /35/)

- Letter of Approval issued by Chinese government: No.1398 issued in September 2008 (English version) and No.[2008]2513 issued on 22/09/2008 (Chinese version)
- Letter of Approval issued by Japanese government: 21・06・18 No.27, 18/06/2009 (English and Japanese version)

 VALIDATION REPORT

3.1.1 Confirmation of Ratification

Parties to the Kyoto protocol have been confirmed via the website of UNFCCC as follows:

- Ratification of China: 30/08/2002
- Ratification of Japan: 04/06/2002

3.1.2 Confirmation of DNA

Parties to the Kyoto protocol have been confirmed via both China's and Japan's DNA lists on the UNFCCC website. Letters of approval have been received from both parties. Deloitte-TECO received these letters from the project participants and confirmed them.

The participants are parties to the Kyoto Protocol, participation is voluntary. Referring to the exact title of the proposed CDM project activity as it appears in the PDD submitted for registration, the host party, China, has noted that the proposed CDM project activity will contribute to the sustainable development of the country. It refers to the precise proposed CDM project activity title in the PDD being submitted for registration.

3.2 Project Participants

(Ref. /1/, /6/, /35/)

All project participants listed in the PDD were cross-checked by the letters of approval. Each letter of approval states that participation is voluntary.

3.2.1 ODA Additionality

(Ref. /1/)

It was confirmed that no official development funding is involved.

3.3 Project Design**3.3.1 Chronological table of key events**

(Ref. /1/, /11/, /29/, /43/, /44/)

The history of project activity is summarised in the following table.

Date	Event
09/2006	FSR completed
12/2006	EIA completed
28/12/2006	EIA approved by Baoshan City Environmental Protection Bureau
22/01/2007	FSR approved by Baoshan City Development and Reform Commission
05/04/2007	Board resolution to develop the Project as CDM project activity
27/04/2007	Approval letter of loan
08/10/2007	CDM consultation agreement signed
06/11/2007	Project construction started
20/11/2007	Purchase Agreement for Turbines and Generators
13/05/2008	ERPA signed

VALIDATION REPORT

28/07/2008	Contract with DOE signed
22/09/2008	LOA from China DNA
18/06/2009	LOA from Japan DNA

Deloitte-TECO has cross-checked the listed events by evidential documents, and confirmed their credibility and appropriateness. Timeline of major milestones relevant to the prior consideration of CDM are also analyzed in the following Section 3.7.1.

Deloitte-TECO has validated that continuing and real actions were taken to secure CDM status for the project in parallel with its implementation in line with EB41, Annex 46. Thus, Deloitte-TECO concluded that the above table explains the events taken by the project participants are appropriate in achieving CDM is reasonable.

3.3.2 Technology used

(Ref. /1/, /12, /13/)

This project employs a run-of-river type hydropower plant with total installed capacity of 18.9MW (6.3MW×3). It mainly consists of the dam, diversion tunnel system, power houses, a substation, etc. The dam also has the key components as its major feature:

- Headwork mainly composed of one dam situated on river
- Intake water system including:
- Intake water sluices installed in the gravity dams
- Intake water channels consists of channel with total length of 8,110.527 m
- A pressure forebay,
- A penstock bifurcated into 3 branch pipes feeding the turbines downstream
- Pivot structures mainly composed of a 18.9MW powerhouse, which consists of 3 sets of turbine-generator units with installed capacity of 6.3MW respectively, tail water tunnels, a substation, and county road to facilitate the site transportation.

Deloitte-TECO confirmed the power plant is installed as mentioned in PDD by cross-checking the FSR and on-site visit. By implementation of this project, no green house gases are generated in the boundary.

The Project uses three units of HLA616-LJ-110 turbine and SFW6300-10/2600 generator matched. These equipments are domestically manufactured. No technology transferred from other countries is involved. Detailed technical parameters of the Project are given in Table A.1 below.

The selected methodology can be applied as shown below.

Applicable conditions	Project	Decision
Hydro power with dam-toe hydropower station	Yes	OK
Existing reservoir	No	OK
Power density >4W/m ²	Yes, 1,125W/m ²	OK
Geographic and system boundaries: clear	Yes, confirmed by on-site visit	OK

VALIDATION REPORT

3.3.3 The project's contribution to sustainable development

(Ref. /6/)

Chinese government described the project's contribution in its letter of approval.

3.3.4 PDD compliance

(Ref. /1/)

CDM- PDD ver. 03 forms are used. The PDD was confirmed to be complete and in accordance with CDM- PDD guidance (ver. 07).

3.3.5 Project duration and crediting time

(Ref. /1/)

According to section C.1. of the PDD, the project is to last for duration of 30 years. The project's crediting period of 7 years may be renewed two times. The start date for the crediting period is 01/02/2010 or the registration date, whichever is later.

It is confirmed by the PDD and the interview during the on-site visit and concluded it is adequate.

3.4 Project Boundaries

(Ref. /1/, /2/, /10/, /33/, /38/)

The project boundaries were clearly defined and confirmed during the on-site visit. The identified boundaries and selected sources and gases were justified for the project activity through a desk review of the PDD and the on-site visit that included an inspection of the project site area, design book, facilities as well as personal interviews. It was concluded that no other emission sources exist for this project and no deviations were found. The water surface area of the reservoir was surveyed in the FSR for the 18.9MW hydropower project. Since the power density of the reservoir for this power plant is $1,125 \text{ W/m}^2$, greenhouse gas emissions due to project activity is zero.

3.4.1 Appropriateness of project boundaries

(Ref. /1/)

The PDD defines that the system boundary covers all power plants physically connected to South China Power Grid (SCPG) as illustrated in the figure of the PDD. Electricity voltage generated by the project activity will be increased to 110kV and transmitted from the substation lines to Yunnan Power Grid, a local power grid, and finally sent to SCPG.

Deloitte-TECO judges that the definition of the system boundary is appropriate; during the on-site visit for assessment, it was confirmed that the project activity is to construct a new hydropower station with a run-of-river reservoir type hydro power plant, and generated power will be transmitted to SCPG.

VALIDATION REPORT

The electric power sale to SCPG through the Yunnan Power Grid was confirmed through the interview with the PP and the grid emission factor was confirmed with information on grid data released through website of CDM in China.

The system boundary and associated emissions are summarized in the table below.

System Boundary and Emissions

	GHGs involved	Description
Baseline emissions	CO ₂	Main emission source and the only GHG emission identified that a hydropower plant which decreases the GHG emission as renewable energy instead of fossil fuel energy in SCPG
Project emissions	None	The power density is calculated by dividing “installed capacity (18.9MW)” by “area of new reservoir (16,800m ²),” which is 1,125W/m ² and greater than 10W/m ² .
Leakage	None	-

It is confirmed that the project emission is not involved for the proposed CDM project. Thus the project boundaries are clearly explained and shown in the PDD.

3.5 Baseline

3.5.1 Approval of baseline methodology

(Ref. /1/, /2/, /4/, /9/, /19/, /36/, /42/)

- Baseline identification

Emissions reductions are determined via the ACM0002 ver. 08 methodology mentioned in the PDD. The project uses hydropower technology to supply electricity. Official emissions factors authorized and issued by the Chinese government are used to calculate the amount of emissions reduction. The FSR used as the basis of this project was developed by Changning County Jia Yuan Electric Power Development Co., Ltd. This project is in line with Chinese government requirement and all data, including sources, are mentioned in the PDD. Baseline conditions are as stated in the following table.

Items	Yes/No	Evidences
Electricity delivered to grid	Yes	
Emission factors are calculated with the “tool to calculate the emissions factor for an electricity system.”	Yes	“China’s Grid Baseline Emission Factors Calculation Result” published by NDRC in 2008.
Spatial boundary contains power plants	Yes	

Scenarios and their adequacy are as follows:

VALIDATION REPORT

Scenario	Adequacy
1. Proposed project not undertaken as a CDM project activity	No, due to low revenue, financially not attractive
2. Construction of a coal-fired power plant with equivalent installed capacity or annual electricity generation	No, not in compliance with current regulation requirements
3. Construction of a new power plant from other renewable sources with equivalent annual electricity generation connected to the grid	No, according to China's power regulations, coal-fired power plants of less than 135MW, if without special permission, are prohibited for construction in the areas covered by large grids.
4. Equivalent electricity service provided by the South China Power Grid	Yes, baseline

As shown under “Adequacy” in the table above, the baseline scenario is justified. After listening to the stakeholders, Deloitte-TECO confirmed that relevant national and/or sectoral policies and circumstances have been taken into consideration. In compliance with part B.4 of the PDD, the approved baseline methodology has been correctly applied to identify the most reasonable baseline scenario. The identified baseline scenario reasonably represents what would occur in the absence of the proposed CDM project activity.

Web information and literature about China were cross-checked.

3.5.2 Correct application and justification of selected baseline methodology and the project's environmental additionality

(Ref. /1/, /33/, /38/)

According to ACM0002 ver. 08, “Tool to calculate the emission factor for an electricity system (version 01.1)” was applied in this project. An on-site inspection has confirmed that this project is a run-of-river type hydropower generation during the on-site visit with its drawing. The power density was also confirmed as $1,125 \text{ W/m}^2$, much greater than 4 W/m^2 of run-of-river reservoir type hydropower generation. As conclusion, it has met the conditions stated in 3.5.1 above.

3.6 Algorithm/Formulae Used to Determine Emission Reduction, and Calculation of GHG Emissions

(Ref. /1/, /36/)

Emissions reductions are calculated according to the methodology, ACM0002 ver. 08, using an emission factor calculation based on the approved “Tool to calculate the emission factor for an electricity system (version 01.1)”. On its public website, the Chinese government (NDRC) provides a clear explanation of tools for adequate utilization, with concrete emission factors for dedicated areas in China to support the PPs. All parameters used in the PDD are checked against the NDRC website data issued on 30/12/2008, and estimated emission reductions were recalculated for confirmation.

VALIDATION REPORT

The emission factors applied in PDD was altered during the validation process. The factors applied in PDD for GSC were drawn from the data issued by NDRC on 18/07/2008, however, they were amended following the update made by NDRC, adopting the factors issued on 30/12/2008 in the final version of PDD. Since the accuracy and traceability of the data issued on 18/07/2008 were no longer assurable, as they were withdrawn from NDRC official website, and the revised emission factor turned out to be more conservative, as is shown below, Deloitte-TECO concluded that the alteration is reasonable, and accepted the change. No disparity was found between the emission factors used in PDD and those published by NDRC on 30/12/2008.

NDRC issued emission factors of SCPG			Calculated CM
Issuing date	OM	BM	
18/07/2008	1.0608	0.6968	0.8788
30/12/2008	1.0608	0.6816	0.8712

The process concluded that the calculation was correct. Since this project uses hydropower to supply electricity to the existing national grid. Low-cost/must run resources constitute less than 50% of total grid generation at about 28.7~33.5% for 5 years (2002-2006), a simple OM method can be used. The amount of electricity generated is estimated at 92,345MWh/year (18.9MW×4,886hrs/year). Taking turbine and generator efficiency into consideration, the actual electric supply will be sent directly to the grid, the Yunnan Grid, with amount of 90,272MWh after deducting the amount consumed internally (0.25%). Consequently, annual GHG reduction is calculated at 78,645 tCO₂e. Since both main and backup meters will be installed at the outlet of the transformer substation of the proposed hydropower station, the transmission loss does not have to be factored in transmission loss calculation. All assumptions and data used by the project participants are listed in the PDD.

The estimated operating hours are 4,886 hours, which is derived from the annual electricity supplied to the Grid. It is calculated by dividing the annual grid supplied electricity by the installed capacity (4,886hrs = 92,345 MWh/year / 18.9MW). This leads to the plant load factor of approximately 54.5%. All the parameters used in this calculation, such as the annual electricity generated and supplied, and the operating hours, are quoted from the FSR, which is produced by Changning County Jia Yuan Electric Power Development Co., Ltd., a third party contracted by the project participant, in prior to creating the PDD. Also, the FSR is approved by Baoshan City Development and Reform Commission, which are the governmental sectors. From those facts, Deloitte-TECO concluded that the plant load factor of this project is derived in accordance with the options listed in EB48 Annex 11, 3(a) and (b), and is correctly determined.

No discrepancy was found between the data and assumption in the documents and the contents of the PDD. The data referred to in the PDD are appropriate and reasonable. As mentioned in the section on the application of the methodology, it has been applied correctly. Guidelines provided on the Chinese government website have been followed to verify the data used to calculate emissions factors.

VALIDATION REPORT

3.7 Additionality of project activity

(Ref. /1/, /2/, /4/, /36/)

The “Tool for the demonstration and assessment of additionality (ver. 05.2)” has been used for validation of this project. The data used was estimated by the Baoshan City Wanrun Hydro & Power Survey Design Institute. The investment cost was derived from detailed quotations for equipment cost, installation costs, and also construction cost. These figures were confirmed through a review of evidentiary documents during the on-site visit. The prices for equipment were checked against the contract concluded between the project owner and the vender. An IRR study concluded that the project was neither feasible nor attractive without CER, because the IRR was less than the Chinese government’s official 10% benchmark figure for small scale hydropower project (under 50 MW) in China. All data were cross-checked against web information and literature on China.

Deloitte-TECO assessed the additionality of the project activity with the following steps as below.

3.7.1 Prior consideration of the clean development mechanism

(Ref. /1/, /2/, /8/, /12/, /16/, /17/, /43/)

(1) Prior consideration of CDM

The FSR for this project, completed in 2006, determined that it was not feasible due to a low IRR. The FSR went to a conclusion that the IRR of proposed project was lower than benchmark, and the project faced a problem of bad finance attractiveness. Based on this, the Changning County Jia Yuan Electric Power Development Co., Ltd. suggested in the FSR that CDM could be considered as an applicable way and the revenue from CERs would improve the financial situation of the project. In conclusion, the project owner decided to develop the project as a CDM project. After floating the project as a CDM, the project participants were able to successfully initiate the project with bank funding in the project. These developments were confirmed in interviews with the staff and owner during the on-site visit which touched on the following points:

- a) As a reliable source of evidence, regarding the consideration of CDM project, and the decision made by the Board of Directors, continued discussion memoranda dated on 05/04/2007 was confirmed. It mentions the necessity of CER for the project.
- b) Continuation and real actions taken to secure CDM status were confirmed with:
 - Grid Connection Agreement concluded (15/06/2006)
 - Permission for starting construction (06/11/2007)
 - Purchase agreement for turbines and generators (20/11/2007)
 - CER Purchase Agreement concluded (13/05/2008)

The documented evidences were all available, and endorsing the actions above, which demonstrate continuing and real actions. In conclusion, the proposed project activity complies with the requirements of EB41, Annex46 C 5.

VALIDATION REPORT

Deloitte-TECO has cross-checked all the listed evidence, and confirmed their credibility and appropriateness. In conclusion, Deloitte-TECO judges that the above timelines explains the actions/events taken by the project participants are appropriate in achieving CDM, and the time gap between the project decision and the PDD publication is reasonable.

(2) Starting date of the project

The evidential document, “Permission for starting construction”, confirmed the start date of 06/11/2007 as stated in ver. 05 of the PDD, which was the earliest date among the actions taken for the project activity.

3.7.2 Identification of Alternatives

The alternative b) in B.4. of PDD, construction of coal-fired power plants with installed capacity below 135 MW, is not in compliance with current regulation requirements and is not credible and realistic. The alternative d) in B.4. of PDD is assessed as the credible and feasible alternative. The other alternatives given in B.4. of PDD cannot be considered as realistic alternatives because: The alternative c) was not financially attractive since generation cost of renewable resources (e.g. wind, solar, biomass, etc.) is much higher than the other sources. The alternative a) was excluded due to being non-financially attractive without the injection of CERs sales revenue from CDM. In conclusion only alternative d) remains as a plausible and credible alternative. The analysis is also described in the Table in the Section 3.5.1.

Alternatives:

a)	The proposed project not undertaken as a CDM project activity
b)	Construction of a coal-fired power plant with equivalent installed capacity or annual electricity generation
c)	Construction of a new power plant from other renewable sources with equivalent annual electricity generation connected to the grid
d)	Equivalent electricity service provided by the South China Power Grid

3.7.3 Investment analysis

(Ref. /1/, /2/, /20/, /34/, /39/)

(1) Consistency of FSR and PDD

Deloitte-TECO confirmed the project is the case that the project participants rely on values from the FSR which is approved by Baoshan City Development and Reform Commission. Therefore, Deloitte-TECO validated the consistency between the PDD and the FSR in accordance with the EB38 paragraph 54 (c) by cross-checking and appropriate manner. Deloitte-TECO confirmed that all data used in the PDD was derived from the FSR, including fixed asset investment, annual O&M cost, etc. and found that there was no discrepancy between the PDD and the FSR. The PDD specified the required 10% benchmark figure to be used for small scale (less than 50 MW) hydropower plants. The FSR was originally prepared by local Chinese experts and verified by Deloitte-TECO accountants.

VALIDATION REPORT

(2) Project continuity

Although the validation process started after almost two years since completion of FSR, financial data in the FSR deemed to be valid as the project continued to be implemented, as substantiated with equipment purchase agreement (signed on 20/11/2007), and starting construction (06/11/2007) meanwhile.

As a consequence of the confirmation of the time of above, Deloitte-TECO concluded that the period of time between the finalization of the FSR and the investment decision is sufficiently short. Therefore, it is unlikely in the context of the underlying project activity that the input values would have materially changed.

(3) Input values cross-check

Deloitte-TECO conducted cross-checking for major input values as follows.

1) Fixed asset investment

Financial data was prepared by Baoshan City Wanrun Hydro & Power Survey Design Institute, who is the experts in this area. The DOE focused on confirming if the investment cost for the capacity of the equipment, approximately 4,870 yuan /kW for 18.9MW, was appropriate. The unit cost seems within the same order.

Investment costs per generating capacity of registered CDM project activities, calculated from data disclosed in the PDD, are approximately 6,000-9,000 yuan /kW. This calculation indicates that the investment cost to the capacity of the proposed project is close to this range, and reasonable in comparison.

The purchase contract for the turbine, generator and auxiliary equipment was obtained as an additional reference, and cross-checked to confirm the relevance of the estimated equipment cost utilized in the FSR. This cross-check revealed no significant difference between the figures in the contract and those in the FSR.

2) Annual O&M cost

The trend of annual O&M cost in the similar condition of the proposed project shows in the range of 1.74-3.27% based on the data of registered CDM large-scale hydropower projects in SCPG after 2004. Since the annual O&M cost is 2.79% of the proposed project, it is concluded that this figure is relevant and appropriate.

3) Tariff

Deloitte-TECO utilized the tariff to analyze the range of sensitivity analysis. The tariff in the FSR is 0.146 yuan/kWh (VAT excluded). In fact, the tariff is in the range of 0.1379-0.4566 yuan/kWh (VAT excluded) based on the data of similar registered large-scale hydropower projects in SCPG from the UNFCCC website. It is concluded that the tariff is relatively lower but still relevant and appropriate in this region.

(4) Benchmark

The benchmark analysis (Option III) was selected to assess the financial viability of the project activity. An IRR benchmark of 10% is noted in the PDD. This benchmark is completely in line with the figures in the document entitled, "Interim Rules on Economic Assessment of Electric Engineering Retrofit Projects", that is included in the PDD. Thus, Deloitte-TECO assessed that the suitability of applied benchmark and confirmed it is appropriate.

VALIDATION REPORT

(5) IRR sensitivity analysis

The IRR sensitivity calculations, in excel spreadsheet format provided by the project, were checked by the validation team. An IRR checklist based on EB41 Annex 45, "Guidance on the Assessment of Investment Analysis," was used to check how suitable the assumptions used to develop the investment analysis were. The validation check confirmed that the selected factors were adequate considering their impact on IRR, and important variables:

- Fixed asset investment
- Annual O&M cost
- Expected tariff
- Annual electricity output

The validation process concluded that the project was neither feasible nor attractive. Even if the total static investment cost was cut, annual electricity output increased and other factors changed, the project would still not be feasible. The calculated IRR of 8.19% could be upped beyond the 10% benchmark to 14.57% if CER was included as an additional revenue source. The project is neither feasible nor attractive without CER.

Deloitte-TECO validated in accordance with the guidance of EB 41 annex 45 paragraph 17, and concluded that the range of variations in parameters was rational and applicable as follow:

1)Fixed asset investment

Deloitte-TECO confirmed that the prices of materials such as iron and cement, have been increased during the construction. The price index for investment in fixed assets raised about 5.5% from 2005 to 2007 according to China Statistical Yearbook 2008. It is considered that the decrease of investment cost unlikely occurs in the actual situation but it could act in a manner similar to the price index. In conclusion, Deloitte-TECO confirmed that the range of +10% and –10% is appropriate.

2)Annual O&M cost

As described previously, the annual O&M cost is only 2.79% of the fixed asset investment and it is considered that the impact on the fixed asset investment is not significant. Taking into account the economic situation in China and the situation of the fixed asset investment mentioned above, predicting this level of significant decrease was considered not plausible. Thus the range of +10% and –10% is appropriate.

3)Expected tariff

As previously indicated that the tariff in the FSR is 0.146 yuan/kWh (VAT excluded). Given current demand trends in China, it is considered that the electricity price may rise gradually in the future. However, the electricity tariff is strictly controlled by the Chinese government. In the context of such background and the situation, the tariff is unlikely to be markedly increased. Thus it is said that the range of +10% and –10% is appropriate.

4)Annual electricity output

The annual electricity output was calculated as the product of installed capacity and the expected operational hours for the proposed project. The installed capacity has been

VALIDATION REPORT

validated by checking the design and name plate capacity data. The expected operational hours of the proposed project was based on the statistical records. The applied average annual flow was confirmed in the FSR. It is unlikely that the annual electric output will be markedly increased affected by water flow. Deloitte-TECO confirmed the variations of electricity generation were impossible to exceed +10% and –10% ranges.

In conclusion, Deloitte-TECO confirmed that the range of +10% and –10% is appropriate for all parameters selected.

After the review and revisions were completed, Deloitte-TECO confirmed all calculations in PDD ver. 05 as adequate.

3.7.4 Barrier analysis

An investment barrier analysis was selected as step 2 in the assessment of additionality. The barrier analysis is not applicable.

3.7.5 Common practice analysis

(Ref. /1/, /2/, /11/, /22/, /40)

According to the paragraph 118 of the Validation and Verification Manual (version 01) of EB44, *“If similar and operational projects, other than CDM project activities, are already “widely observed and commonly carried out” in the defined region, assess whether there are essential distinctions between the proposed CDM project activity and the other similar activities”*.

Deloitte-TECO confirmed that the common practice analysis has done appropriately.

The common practice analysis of the proposed project included the following criteria:

(1) Similar scale

A screening of similar plants has done by the similar scale of installed capacity (range of 10MW and 50MW), in accordance with “Classification & design safety standard of hydropower projects (DL5180-2003)” issued by State Economic and Trade Commission of People's Republic of China in 2003. In this classification, hydropower plants are divided into five categories based on the project scale and their importance to economy. The installed capacity of the proposed project is 18.9 MW and it belongs to category IV. Since Category IV covers hydropower plants with the installed capacity between 10-50 MW, it is reasonable to the proposed project selected between 10-50 MW.

Therefore the application of this criterion is considered reasonable and appropriate.

(2) Similar area

As the development policy and investment environment for each province for hydropower projects is so different from region to region in China. Therefore, as for the proposed project, Yunnan province was chosen as the similar area.

Deloitte-TECO confirmed that the application of this criterion is considered reasonable and appropriate.

VALIDATION REPORT

(3) Similar construction year

The proposed project activity has installed capacity of 18.9MW and was approved by Chinese government on 22/01/2007. A survey of projects with similar installed capacity which are operated after 2002 located in this area with any public financial support under favorable policy support shows that seven similar projects exist explained in Step 4 in B.5. of the PDD. Then, those facts described above show that the proposed project is not common practice in this region at the time of PDD preparation. The screening included a financial background check and investigation of the regulatory framework behind these similar plants. The financial background investigation determined whether the plants received any local government funding or ODA grants. The review of the regulatory framework looked to see if special approval was gained for the production of electricity or if the premium price of electricity is vested.

Deloitte-TECO confirmed that the application of this criterion is considered reasonable and appropriate.

After screening by utilizing above mentioned criteria and excluded CDM project, there are seven projects were remained for common practice analysis. These projects were analyzed as follows:

(1) Unit Investment Condition

The unit investment of Maomaotiao hydropower station, Nanting River hydropower station, Xiashilong hydropower station, and Yanziya hydropower station is significantly lower compared with the proposed project, which means these projects are more financially attractive than the proposed project.

(2) Governmental Involvement

The projects of Houqiao hydropower station and Wuni River hydropower station have joined the West-East Electricity Transmission Project, a government project aims to transmit electricity from west of China such as Guizhou province, Yunnan province, Sichuan province, etc. to east of China where power shortage is serious issue such as Shanghai, Guangdong province, Jiangsu province, etc. These two projects help the involved projects get favorable economic conditions.

(3) Financial Support

As for Laodukou Hydropower Station, one of its shareholders is Luoping Zinc-electricity Co., Ltd. which is a listed company in Shenzhen Stock Market. The listed company has higher credit rating in the bank, and this will help the project get finance easily.

It is confirmed that these seven projects have essential distinctions from the proposed project in the aspects of unit investment and operation hours as well as lower tariff. In addition, the project owner is a local enterprise, which bears higher risks in financing such as pressure from principle repayment and payment of interest on loans, etc. Therefore Deloitte-TECO concluded that the project is not common in Yunnan province and it is additional.

VALIDATION REPORT

3.8 Monitoring Plan

(Ref. /1/, /2/, /4/, /7/, /13/, /15/, /23/, /32/, /37/)

3.8.1 Collecting data and reporting

Since this is a large scale hydropower project, ACM0002 ver. 08 monitoring methodology was applied. The monitoring plan provides detailed information related to the collection and archiving of all relevant data needed to:

1. Estimate or measure emissions occurring within the project boundary:

No emission occurs within the project boundary. The imported electricity is measured by an electricity meter (main meter) installed at the outlet of the transformer substation of the hydropower station, owned by the project owner. The meter will be read by the grid company and the project owner. The grid company reports electricity transfers via an invoice. After calculating net generated electricity, the amount is subtracted from the total exported to the grid.

2. Determine the baseline emissions:

Exported electricity is measured by a main meter installed in the substation. The baseline emission is calculated by multiplying exported electricity by the emission factor as defined in Step 7 of B.6.1 and B.6.3 in the PDD.

3. Estimate changes in emissions outside the project boundary:

No changes in emissions will occur outside the project boundary since the only output of the project is electricity.

It was confirmed that all important indicators for controlling and reporting project performance are incorporated in the monitoring plan.

3.8.2 Monitoring system

- Organization of monitoring system and the emission reduction calculation are supported by the consultants, and operation of the plant and recording data are conducted by the licensed persons hired. Electricity meters etc. are regulated by “Technical Administrative Code of Electric Energy Metering (DL/T448-2000)”.
- In order to keep the reliability of meters, project participant (PP) will cross check (main meter and back-up meter) at the end of every month with buyer, such as grid company.
- The PP works with consultant to sustain their ability to operate the power plant and execute monitoring plan. The knowledge regarding the facility, operation, maintenance, monitoring and archiving for CDM, such as configuration of the process, measuring points regarding the GHG emission, accuracy of meters, frequency of measuring, calculation system, recording system, filling system, and security system, are implemented with the consultant.
- The PP trains operators, getting the support from consultants.
- It was confirmed that the PP has an ability to operate the plant, and execute the reduction of emission and calculate its amount and record, with the assistance of reliable consultant.

VALIDATION REPORT

3.9 Sustainable development

(Ref. /1/, /2/, /4/, /6/)

The contribution to sustainable development by the project was confirmed in a letter of approval from the Chinese DNA and in interviews with the stakeholders during the on-site visit.

3.10 Environmental Impacts

(Ref. /1/, /3/, /5/)

As regulated by Chinese law, an EIA was conducted for this project. The Yunnan University performed the EIA which was approved by the Baoshan City Environmental Protection Bureau on 28/12/2006. The EIA determined the project would cause no serious problems.

3.11 Comments by Local Stakeholders

(Ref. /1/, /25/, /26/)

According to the requirement by the “Measures for Operation and Management of Clean Development Mechanism Projects in China”, a survey on the local residents has been conducted.

Questionnaires were prepared, and distributed to thirty (30) residents. The response and collection rate was 100%. All those who participated in completing the questionnaire supported the project due to the increased opportunity for employment and income that it brought. No concerns about any adverse impacts on the environment were raised.

To confirm the relevance of respondent selection and substantiate the comments by local stakeholders described in the PDD, Deloitte-TECO assessed the questionnaires prepared by the PP and conducted independent interviews with local stakeholders during the on-site visit. The Deloitte-TECO found that those interviewed were stakeholders who actually lived near the project boundary and/or persons who were displaced from their homes by the construction of the power plant. The validation team found that the local stakeholders were happy about the project since it helped to improve their lives. Deloitte-TECO confirmed, through the interviews during the on-site visit, that the project owner is making efforts to minimize environmental impact during construction and operation. Deloitte-TECO also interviewed those who were displaced by the project and confirmed that they were satisfied with the compensation plan.

4 COMMENTS BY PARTIES, STAKEHOLDERS AND NGOS

The PDD of 03/07/2008 (version 01) was made publically available on the Deloitte-TECO's website (http://www.teco.tohatsu.co.jp/service/cdm/cdm9_6.html) on 02/08/2008, and invited comments until 31/08/2008 from all parties, stakeholders and non-governmental organisations. No comments were received during the period.

It must be noted that this project was made publicly available for stakeholder comments under the project title “Yunnan Kawan 18.9MW Hydroelectric Project.”

VALIDATION REPORT

5 VALIDATION OPINION

Deloitte-TECO has performed a validation of the "Changning Kawan 18.9MW Hydroelectric Project" in China. The validation was performed on the basis of UNFCCC criteria and host country criteria, as well as criteria given to provide for consistent project operations, monitoring and reporting. The validation was composed of desk review with risk analysis, on-site visit, follow up assessment, and finalizing conclusion based on the evidences collected during the validation. CDM team members' details are shown in "6.1 Team". Further Information on quality control within the team/of the validation process is shown "6.2 Internal Quality Control". Public comments were invited through global stakeholders' consultation process. No comments were received, thus no modification was made as a result.

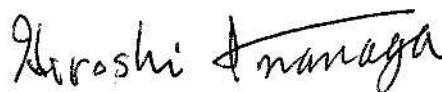
The validation has revealed that there is no information indicating the project receives any public funding which may result in a diversion of Official Development Assistance (ODA).

The review of the project design document and the subsequent follow-up interviews have provided Deloitte-TECO with sufficient evidence to determine the fulfilment of stated criteria. In our opinion, the project meets all relevant UNFCCC requirements for the CDM and all relevant host country criteria. Deloitte-TECO also has confirmed with the letter of approval from the host Party that the project activity assists in achieving sustainable development. Hence, the project will be recommended by Deloitte-TECO for registration with the UNFCCC.

By displacing fossil fuel-based electricity with electricity generated from a renewable source, the project results in reductions of CO₂ emissions that are real, measurable and give long-term benefits to the mitigation of climate change. An analysis of the investment barriers demonstrates that the proposed project activity is not a likely baseline scenario. Emission reductions attributable to the project are hence additional to any that would occur in the absence of the project activity. Given that the project is implemented as designed, the project is likely to achieve the estimated amount of emission reductions.

If the project is implemented as designed, the project is likely to achieve the estimated amount of emission reductions (expected figure is 78,645 tCO₂e/year) under the assumptions made applying methodology ACM0002 ver. 08 for emission reduction calculation as specified in the final PDD ver. 05.

07 August 2009



Hiroshi Inanaga

Chief Executive Officer

Deloitte Tohmatsu Evaluation and Certification Organization

VALIDATION REPORT

6 VALIDATION TEAM

6.1 Team

Name	Organization	Role on the team	Sectoral number
AIKOSHI, Hiromu	Deloitte-TECO	Team leader, validator	1,3,6,7,13
OTANI, Yuichi	Deloitte-TECO	Team member, validator	1,3,4,13,15
KASAI, Katsuya	Deloitte-TECO	Team member, validator	4, 5, 13
SHI, Xueting	Deloitte-TECO	Team member, validator	-
HAYASHI, Toshio	Deloitte-TECO	Technical reviewer, Lead Auditor	1,2,3,5, 10, 12, 13
INANAGA, Hiroshi	Deloitte-TECO	Engagement Quality Assurance	3,13
ICHIKAWA, Masahiko	Assessment Committee	Chairman of Assessment Committee	-
INANAGA, Hiroshi	Deloitte-TECO	Chief Executive Officer	3,13

6.2 Internal Quality Control

The draft and final validation reports were reviewed according to Deloitte-TECO's internal quality control policy. A technical review was performed by a technical reviewer meeting Deloitte-TECO's qualification criteria for CDM validation as follows:

Engagement Quality Assurance Review System

Step	Reviewer	Objectives/Responsibilities	Information (Input)	Reports (Output)	Details/Comments
1	GHG Audit Director	Review the validation process from an independent standpoint to ensure that it was effective, efficient, and, that every step was in conformance with the "Regulations for CDM Audits" and "Operational Management Procedure CDM (Validation/Verification)".	PDD (monitoring plan) Audit plan document Validation/Verification report DR DR report VVM (mainly sections A, C, and E)	Completion of requested corrections Confirmation of evidence for VVM Abstract of Audit outcome Witnesses	Checkmarks Add comments to the abstract
	When the GHG Audit Director doesn't have the necessary expertise, include a	Perform a technical review of additionality, baseline methodology, and monitoring methodology.	The latest approved methodologies PDD (monitoring plan) Request for review VVM (mainly sections B and D)	Assessment of applied methodologies Confirmation of accuracy and reliability of data and equations,	Comments on materiality and uncertainty

VALIDATION REPORT

Step	Reviewer	Objectives/Responsibilities	Information (Input)	Reports (Output)	Details/Comments
	technical review.				
2	Engagement Quality Assurance Reviewer	Review how appropriate each step of the process was, from the order for the CDM project to registration request to EB, based on “CDM Audit Manual” and related procedures.	Statement on procedures Abstract of audit outcome Witness	Engagement Quality Assurance statement for operational procedures	Note concerns in comment field
3	Assessment Committee	Perform an Engagement Quality Assurance Review to assess CDM project registration submissions and/or the respond to requests for a review from CDM EB, in order to render a fair and objective decision based on steps (1) and (2).	PDD(monitors plan) Validation/Verification report DR	Minutes of Assessment Committee	Add comments to the minutes
4	Chief Executive Officer	Express the final opinion, based on (1),(2), and (3),	Engagement Quality Assurance statement for operational procedures	Opinion (Validation/Verification Report)	Need to comment if it is a negative opinion

*1. The reviewers shall be as qualified or more qualified than the audit team leader.*2. An audit team leader, audit director and EQAR shall not concurrently supervise the same personnel.

7 REFERENCES

	<i>Title</i>
/1/	PDD (version 05)
/2/	Feasibility Study Report (FSR) of the Project
/3/	Environmental Impact Assessment (EIA) of the Project
/4/	Official Approval Letter of FSR <approved on 22/01/2007>
/5/	Official Approval Letter of EIA <approved on 28/12/2006>
/6/	LOA (China)
/7/	Corporation Bylaws of Changning County Jia Yuan Electric Power Development Co., Ltd.
/8/	Certified Emission Reductions Purchase Agreement <agreed on 13/05/2008>
/9/	Business license of Changning County Jia Yuan Electric Power Development Co., Ltd. <From 21/11/2005 for 20 years>
/10/	Grid Connection Agreement <approved on 15/06/2006> PDD 13 page investment analysis
/11/	Financial statements of the project owner (B/S, C/F) most recent quarter
/12/	Business Agreement of Turbine, Generator and Ancillary Equipment <agreed on 20/11/2007>

VALIDATION REPORT

	<i>Title</i>
/13/	Technology Agreement of Turbine, Generator and Ancillary Equipment <agreed on 20/11/2007>
/14/	Water Resource Demonstration Report of the Project (part) <approved on 07/2006>
/15/	Training Plan for Powerstation Operators <issued on 27/05/2008>
/16/	Construction Schedule Plan <issued on 03/11/2008>
/17/	The Starting Date of The Project Activity (permit for starting construction) <issued on 06/11/2007>
/18/	Documents regarding the existing grid with which the Project will be connected: ◇Current power supplying capacity, ◇Electricity demand in 2007
/19/	Notice on Strictly Prohibiting the Installation of Fuel-fired Generators with the Capacity of 135MW or below Issued by State Council Office, decree no. 2002-6.
/20/	Economic Evaluation Code for Small Hydropower Projects (SL16-95) <issued on 01/07/1995>
/21/	China Hydro Resources Yearbook 2003 & 2006
/22/	Evidential documents of footnotes for "Common practice analysis" in PDD
/23/	Control Procedure Draft (incl. operating manual of turbines and generators)
/24/	Approval of Land Use (approved by Baoshan City on 11/09/2008)
/25/	Stakeholder list & Questionnaires for stakeholders' comments (all) <conducted on 10/10/2007>
/26/	Measures for Operation and Management of Clean Development Mechanism Projects in China <issued on 12/10/2005>
/27/	Contact Information (E-mail address) of Changning County Jia Yuan Electric Power Development Co., Ltd.
/28/	Contracts with Consultants for CDM services <contracted on 08/10/2007>
/29/	Table of key event history from the start of feasibility study to present
/30/	Profile of CDM Technical Service Center of Yunnan <issued on 04/2008>
/31/	Primary Design Report for Water and Soil Conservation Scheme <issued on 11/2006>
/32/	Layout Plan of Meters
/33/	Definition of "run-of-river" in China
/34/	Excel Spreadsheet for IRR and Sensitivity Analysis
/35/	LOA (Japan)
/36/	China Electric Power Yearbook 2002-2006
/37/	Procedure manual of monitoring (draft) <issued on 27/03/2009>
/38/	Report of reservoir area <issued on 15/04/2009>
/39/	Average Increase of Enterprises Wage in 2005-2008 (Website of Yunnan Labour and Social Security)

VALIDATION REPORT

	<i>Title</i>
/40/	West-east electricity transmission project (web news)
/41/	Tool to calculate the emission factor for an electricity system (version 01.1)
/42/	ACM0002 Consolidated methodology for grid-connected electricity generation from renewable sources ver. 08
/43/	Board resolution to develop the Project as CDM project activity
/44/	Approval letter of loan agreement

VALIDATION REPORT

Appendix A: Validation Protocol

Table A1 Mandatory Requirements for Clean Development Mechanism (CDM) Project Activities

Project title: Changning Kawan 18.9MW Hydroelectric Project

ID	REQUIREMENT	REFERENCE	CONCLUSION	Cross Reference / Comment
1	The project shall assist Parties included in Annex I in achieving compliance with part of their emission reduction commitment under Art. 3	Kyoto Protocol Art. 12.2	OK Japan is one of the parties included in Annex I. Obtained a letter of approval from the Japanese DNA confirming Japan's voluntary participation.	Table A2, ID#67(c)
2	The project shall assist non-Annex I Parties in achieving sustainable development and shall have obtained confirmation by the host country thereof	Kyoto Protocol Art. 12.2, Marrakesh Accords, CDM Modalities §40a	OK The People's Republic of China is one of the non-Annex I parties. Obtained a letter of approval from the Chinese DNA confirming that the project assists in the sustainable development of China.	Table A2, ID#45
3	The project shall assist non-Annex I Parties in contributing to the ultimate objective of the UNFCCC	Kyoto Protocol Art. 12.2.	OK The People's Republic of China is one of the non-Annex I parties. The project contributes to GHG emission reductions, as well as a sustainable development in China. Letters of approval from both DNAs were obtained.	Table A2, ID#67(c)
4	The project shall have written approval of voluntary participation from the designated national authorities of each party involved	Kyoto Protocol Art. 12.5a, Marrakesh Accords, CDM Modalities §40a	OK The Project has been authorized as a CDM project by both the Japanese and Chinese DNA. Letters of approval from both DNAs were obtained. LoA from China: (No.1398 issued in September 2008 (English version) and No.[2008]2513 issued on 22/09/2008 (Chinese version)) LoA from Japan (21·06·18 No.27, 18/06/2009 (English and Japanese version))	Letter of approval, Chinese and Japanese
5	The emission reductions should be real, measurable and give long-term benefits related to the mitigation of climate change	Kyoto Protocol Art. 12.5b	OK The project has employed hydropower technology, which is a commonly-used renewable energy technology and contributes to long-term GHG emission reductions.	Table A2, ID#67
6	Reduction in GHG emissions must be additional to any that would occur in absence of the project activity, i.e. a CDM project activity is additional if anthropogenic emissions of greenhouse gases by sources are reduced below those that would have occurred in the absence of the registered CDM project activity	Kyoto Protocol Art. 12.5.c, Marrakesh Accords, CDM Modalities §43	OK Additionality of the project has been demonstrated.	Table A2, ID#67
7	Potential public funding for the project from Parties in Annex I shall not be a diversion of official development assistance	Marrakesh Accords (Decision 17/CP.7) CDM M&P AppendixB§2	OK The project has not received any ODA.	-
8	Parties participating in the CDM shall designate a national	Marrakesh Accords (CDM	OK The Japanese government has designated its Cabinet	-

VALIDATION REPORT

ID	REQUIREMENT	REFERENCE	CONCLUSION	Cross Reference / Comment
	authority for the CDM	M&P § 29)	Secretariat's assistant chief Cabinet secretary as the Japanese DNA. The Chinese government has designated the National Development and Reform Commission of the People's Republic of China as the DNA for China	
9	The host country shall be a Party to the Kyoto Protocol	Marrakesh Accords (CDM Modalities § 30)	OK China is a party to the Kyoto Protocol as of the starting date of the project.	-
10	Documentation on the analysis of the environmental impacts of the project activity, including transboundary impacts, shall be submitted, and, if those impacts are considered significant by the project participants or the Host Party, an environmental impact assessment in accordance with procedures as required by the Host Party shall be carried out	Marrakesh Accords, CDM Modalities §37c	OK. EIA report was submitted.	Table A2, ID#130
11	Baseline and monitoring methodology shall be previously approved by the CDM Methodology Panel	Marrakesh Accords, CDM Modalities §37e	OK The project has applied ACM0002 ver. 08 methodology.	Table A2, ID#67 and ID#121
12	Comments by local stakeholders are invited, and a summary of these provided	Marrakesh Accords, CDM Modalities §37b	OK The project has conducted a public investigation of relevant stakeholders.	Table A2, ID#127
13	Provisions for monitoring, verification and reporting shall be in accordance with the modalities described in the Marrakesh Accords and relevant decisions of the COP/MOP	Marrakesh Accords, CDM Modalities §37f	OK It is in accordance with M&P	Table A2, ID#121
14	Parties, stakeholders and UNFCCC accredited NGOs have been invited to comment on the validation requirements and comments have been made publicly available	Marrakesh Accords, CDM Modalities, §40	OK The project activity validation requirements and comments have been made publicly available on the UNFCCC website in accordance with the regulations.	http://cdm.unfccc.int/Projects/Validation/DB/0P/U0S1CQIN/PLRHN3T/R96FUJRO/EGKAK/view.html
15	The baseline methodology shall exclude to earn CERs for decreases in activity levels outside the project activity or due to force majeure	Marrakesh Accords, CDM Modalities, §47	OK The baseline applied is in accordance with ACM0002.	Table A2, ID#67
16	The project design document shall be in conformance with the UNFCCC CDM-PDD format	Marrakesh Accords, CDM Modalities, Appendix B, EB Decisions	OK	-

VALIDATION REPORT

Table A 2 Requirements Checklist**Project title: Changning Kawan 18.9MW Hydroelectric Project**

ID	Means of validation	CHECKLIST QUESTION	Ref.	MoV	Draft Concl.	COMMENTS	Final Concl.
E. Validation requirements based on paragraph 37 of the CDM modalities and procedures							
1. Approval							
45. The DOE shall determine whether each letter confirms that:							
(a)		The Party is a Party to the Kyoto Protocol;	-	DR	OK	Yes, see ID#9 of Table A1.	OK
(b)		Participation is voluntary;	/6/ /35/	DR I	CL11	The letters of approval from DNA of China and Japan had not been issued. The voluntary participation of China and Japan were confirmed with letters of approval from DNA.	OK
(c)	In the case of the host Party, the proposed CDM project activity contributes to the sustainable development of the country;	Is the project in line with relevant legislation and plans in the host country?	/4/ /5/	DR I	OK	It is confirmed that the FSR approved by Baoshan City Development and Reform Commission and the Baoshan City Environmental Protection Bureau approved this project activity in terms of FSR and EIA respectively.	OK
		Is the project in line with host-country specific CDM requirements?	/6/	DR I	OK	The Project received Letter of Approval by the National Development and Reform Commission of the People's Republic of China in September 2008 (No. 1398) and received the evidential document on 14 November, 2008.	OK
		Is the project in line with sustainable development policies of the host country?	/1/	DR I	OK	The proposed project seems in constancy with China's harnessing zero-emission renewable energy resources, contributing a lot to the country and local region. It is confirmed that the description of its contribution in the PDD.	OK
		Will the project create other environmental or social benefits than GHG emission reductions?	/1/	DR	OK	The proposed project provides a combination of environmental and socio-economic benefits. The specific sustainable development benefits of this proposed project are described as follows: - Improve the local and regional economy development by providing electricity to meet its increasing demands; - Support the minority territory's economy development, and to alleviate poverty; - Make greater use of hydroelectric renewable energy generation resources for sustainable energy	OK

VALIDATION REPORT

ID	Means of validation	CHECKLIST QUESTION	Ref.	MoV	Draft Concl.	COMMENTS	Final Concl.
						<p>production;</p> <ul style="list-style-type: none"> - Abate the local air pollution caused from fossil fuel-fire power plants by supplying zero-emission renewable energy to South China Power Grid; and - Contribute to community development and facilitate the development of ethnic cultures. <p>In terms of the environmental and socio-economic benefits, the proposed project is in constancy with China's harnessing zero-emission renewable energy resources, contributing a lot to the country and local region.</p>	
(d)	It refers to the precise proposed CDM project activity title in the PDD being submitted for registration.		/1/	DR	CL11	<p>The project title of the Letter of Approval (LoA) from Japanese DNA was not the same of it from Chinese DNA and the PDD. Please submit a copy (PDF) of a Letter of Approval (LoA) of Japanese DNA, as well as correct its description in the PDD accordingly.</p> <p>The Project received a LoA from the Japanese DNA. DOE received confirmed the evidential document on 26 June, 2009.</p> <p>The LoA of Japanese DNA was received and confirmed by the DOE.</p>	OK
46	The DOE shall determine whether the letter(s) of approval is unconditional with respect to (a) to (d) above.		/6/ /35/	DR	OK	Yes. Since (d) was solved, it was determined that there were no conditions attached to (a) through (d) above.	OK
47	The DOE shall determine whether the letter(s) of approval has been issued by the respective Party's designated national authority (DNA) and if in doubt, shall verify with the DNA that the letter of approval is valid for the proposed CDM project activity under validation. A list of DNAs is available on the UNFCCC CDM website.		/6/ /35/	DR	OK	Yes. It is has been confirmed that the LoAs were issued by the DNA.	OK
48	If the DOE doubts the authenticity of the letter of approval, the DOE shall verify with the DNA that the letter of approval is authentic.		/6/ /35/	DR	OK	Yes. There is no doubt about their authenticity.	OK
2. Participation							
51	All project participants have been listed in a consistent manner in the project documentation, and their participation in the project activity has been approved by a Party to the Kyoto Protocol.		/1/	DR	OK	Yes. Confirmed.	OK
52	The DOE shall confirm that the project participants are listed in tabular form in section A.3 of the PDD and that this information is consistent with the contact details provided in annex 1 of the PDD.		/1/ /27/ /28/	DR I	CAR11	<p>Contact information in Annex 1 is not properly described in the PDD.</p> <p>"Country code of China" to the telephone number of the Project Participant as well as the PPs' email</p>	OK

VALIDATION REPORT

ID	Means of validation	CHECKLIST QUESTION	Ref.	MoV	Draft Concl.	COMMENTS	Final Concl.
						addresses (changing to company email address) are corrected appropriately in the PDD.	
		The DOE shall determine whether the participation of each project participant has been approved by at least one Party involved, either in a letter of approval or in a separate letter specifically to approve participation.	/1/	DR	OK	Yes. Confirmed.	OK
		The DOE shall confirm that no entities other than those approved as project participants are included in these sections of the PDD.	/1/	DR	OK	Yes. Confirmed.	OK
53		The DOE shall ensure that the approval of participation has been issued from the relevant DNA and if in doubt shall verify with the DNA that the approval of participation is valid for the proposed project participant.	/1/	DR	OK	Yes. Confirmed	OK
3. Project design document							
55		The PDD used as a basis for validation shall be prepared in accordance with the latest template and guidance from the CDM Executive Board available on the UNFCCC CDM website.	/1/	DR	OK	Yes. PDD form version 03 is used.	OK
4. Project description							
58		The PDD shall contain a clear description of the project activity that provides the reader with a clear understanding of the precise nature of the project activity and the technical aspects of its implementation.	/1/ /38/	DR	CAR1 CAR10 CAR13	Overall, the project activity is described precisely in the PDD. "Rated water flow" stated as 10.6m ³ /s in the PDD. It, however, is 10.54m ³ /s in the FSR. It is corrected appropriately in the PDD in accordance with its description of the FSR. Adding information of "installed capacity" is also requested and confirmed that it is appropriately corrected in the PDD. The project site is described by its geographical location but no name of river is stated in the PDD. The project site is located along the Kuke River, which is a tributary of Nu jiang River. Those names are added in the PDD.	OK
59. The DOE shall confirm that the description of the proposed CDM project activity as contained in the PDD sufficiently covers all relevant elements, is accurate and that it provides the reader with a clear understanding of the nature of the proposed CDM project activity.							
(a)		Does the project design engineering reflect current good practices?	/1/ /12/ /13/	DR	OK	Yes, the project design engineering reflects current good practices. The turbines and generators are going to be produced by Hangzhou Chunjiang Power Equipments Co., Ltd., which is well known domestic manufacturing company in China. http://www.hangzhoucf.com/english/index.htm	OK

VALIDATION REPORT

ID	Means of validation	CHECKLIST QUESTION	Ref.	MoV	Draft Concl.	COMMENTS	Final Concl.
(b)		Does the project use state of the art technology or would the technology result in a significantly better performance than any commonly used technologies in the host country?	/1/ /12/ /13/	DR	OK	The technology is already available in the country because there are many similar projects and thus no technology transfer is envisaged in the Project. All the equipment produced domestically.	OK
(c)		Is the project technology likely to be substituted by other or more efficient technologies within the project period?	/1/ /12/ /13/	DR	OK	The hydropower technology applied is well developed and is unlikely to be substituted by other or more efficient technologies within the first crediting period.	OK
(d)		Does the project require extensive initial training and maintenance efforts in order to work as presumed during the project period?	/1/ /15/	DR I	CL6	Although the Project operators are all skilful as described in the PDD, it is likely to be expected some initial training for the specific operations. There was no description/explanation of such initial training and maintenance efforts provided in the PDD. However, the description of monitoring personnel training is added in the section B.7.2.	OK
(e)		Does the project make provisions for meeting training and maintenance needs?	/1/	DR I	-	Refer to No.59 (d).	OK
62		(a) For all other proposed CDM project activities not referred to in paragraphs 59 - 61, the DOE shall undertake the validation by reviewing available designs and feasibility studies and may conduct comparison analysis to equivalent projects, as appropriate.	/1/ /12/	DR I	OK	DOE also confirmed the data used in PDD with the figures used in FSR report. It was found that there was no discrepancy between PDD and FSR. Also, as a further reference, the purchase contract of turbine, generator and auxiliary equipments were obtained, and cross-checked to confirm the relevance of equipment estimated cost utilized in FSR. It revealed there was no significant difference between the values in the contract and FSR.	OK
		(b) The DOE may conduct a physical site visit to assess the plan. For proposed CDM project activities for which the DOE does not undertake a physical site inspection this shall be appropriately justified.	-	DR I	OK	On-site visit was planned and carried out on 13-14/11/2008.	OK
63		If the proposed CDM project activity involves the alteration of an existing installation or process, the DOE shall ensure that the project description clearly states the differences resulting from the project activity compared to the pre-project situation.	-	-	-	N/A	-
5. Baseline and monitoring methodology							
(a) General requirement							
66. DOE shall determine whether:							
(a)		The selected methodology is applicable to the project activity;	/1/	DR I	OK	Yes. Confirmed.	OK
(b)		The selected methodology had been correctly applied.	/1/	DR I	OK	Yes. Confirmed.	OK

VALIDATION REPORT

ID	Means of validation	CHECKLIST QUESTION	Ref.	MoV	Draft Concl.	COMMENTS	Final Concl.
67. The DOE shall ensure that the selected methodology applies to the project activity and has been correctly applied with respect to following:							
(a)	Project boundary;	Is the baseline methodology previously approved by the CDM Methodology Panel?	/1/ /42/	DR I	OK	Yes. "Consolidated baseline methodology for grid-connected electricity generation from renewable sources (ACM0002 / Version 08, Sectoral Scope 01, EB44)" is applied.	OK
		Is the baseline methodology the one deemed most applicable for this project and is the appropriateness justified?	/1/	DR	OK	The project is a capacity addition from a renewable energy source and does not involve an on-site fuel switch from fossil fuels to a renewable source. The geographic and system boundaries for the relevant electricity grid, SCPG, can be clearly identified.	OK
		Is the application of the methodology and the discussion and determination of the chosen baseline transparent?	/1/	DR	OK	The baseline is determined on the basis of continued operations of an existing power plant with the addition of new generation sources to meet electricity demand.	OK
(b)	Baseline identification;	Have the major risks to the baseline been identified?	/1/	DR	OK	Explanation of four baseline scenarios were clarified in B.4. of the PDD. There are no significant risks to the baseline.	OK
		Is all literature and sources clearly referenced?	/1/	DR	OK	Yes. All literature and sources in the PDD are clearly referenced and summarized.	OK
(c)	Algorithms and/or formulae used to determine emission reductions;	Are all aspects related to direct and indirect project emissions captured in the project design?	/1/	DR	OK	The project activity is categorized into a run-of river hydropower plant. Project emission is regarded zero as power density is 1,125W/m ² , which is over 10W/m ² .	OK
		Are the project calculations documented in a complete and transparent manner?	/1/ /21/ /41/ /42/	DR	OK	Yes.	OK
		Have conservative assumptions been used to calculate project emissions?	/1/ /42/	DR	OK	Assumptions were based on ACM0002.	OK
		Are uncertainties in the project emissions estimates properly addressed in the documentation?	N/A	N/A	N/A	N/A	N/A
		Have all relevant greenhouse gases and source categories listed in Kyoto Protocol Annex A been evaluated?	/1/	DR	OK	Yes.	OK
		Are potential leakage effects beyond the chosen project boundaries properly	/1/	DR	OK	There were no leaks that needed to be considered.	OK

VALIDATION REPORT

ID	Means of validation	CHECKLIST QUESTION	Ref.	MoV	Draft Concl.	COMMENTS	Final Concl.
		identified?					
		Have these leakage effects been properly accounted for in calculations?	/1/	DR	OK	Refer to above.	OK
		Does the methodology for calculating leakage comply with existing good practices?	/1/	DR	OK	Refer to above.	OK
		Are the calculations documented in a complete and transparent manner?	/1/	DR	OK	Refer to above.	OK
		Have conservative assumptions been used when calculating leakage?	/1/	DR	OK	Refer to above.	OK
		Are uncertainties in the leakage estimates properly addressed?	/1/	DR	OK	Refer to above.	OK
		Have the most relevant and likely operational characteristics and baseline indicators been chosen as references for baseline emissions?	/1/	DR	OK	The relevant characteristics and baseline indicators have been chosen according to the officially issued website of NDRC.	OK
		Are the baseline boundaries clearly defined and do they sufficiently cover sources and sinks for baseline emissions?	/1/ /42/	DR	OK	The baseline boundaries (space and system) are clearly defined in the PDD. The baseline emissions are calculated in accordance with ACM0002 ver. 08.	OK
		Are the baseline emissions calculations documented in a complete and transparent manner?	/1/ /21/ /41/ /42/	DR	OK	The entire calculation processes is fully demonstrated in B.6.1. and the data are completely presented in Annex 3 of the PDD.	OK
		Have conservative assumptions been used when calculating baseline emissions?	/1/ /42/ /42/	DR	OK	Conservative assumptions are used in a manner of the methodology ACM0002 ver. 08.	OK
		Are uncertainties in the baseline emissions estimated properly and addressed in the documentation?	/1/ /42/	DR	CL13	It is confirmed that uncertainties in the baseline emissions estimates are properly added and addressed in a manner of the methodology of ACM0002 version 08.	OK
		Have the project baseline(s) and the project emissions been determined using the same appropriate methodology and conservative assumptions?	/1/ /42/	DR	OK	The project baseline(s) and the project emissions been determined using the same appropriate methodology of ACM0002 version 08.	OK
		Will the project result in fewer GHG emissions than the baseline scenario?	/1/	DR	OK	The annual emission reductions of the project are expected to be 78,645 tCO ₂ e.	OK
(d)	Additionality;	Has the baseline been	/1/	DR	OK	Yes, the baseline determined is	OK

VALIDATION REPORT

ID	Means of validation	CHECKLIST QUESTION	Ref.	MoV	Draft Concl.	COMMENTS	Final Concl.
		determined using conservative assumptions where possible?				emissions reduction due to displacement of grid electricity.	
		Has the baseline been established on a project-specific basis?	/1/ /42/	DR	OK	Yes, the baseline setting is in accordance with ACM0002, considering the alternatives to the specific project activity.	OK
		Does the baseline scenario sufficiently take into account relevant national and/or sectoral policies, macro-economic trends and political aspirations?	/1/	DR	OK	Yes.	OK
		Is the baseline determination compatible with the available data?	/1/	DR	OK	Yes.	OK
		Does the selected baseline represent the most likely scenario among other possible and/or discussed scenarios?	/1/	DR	OK	Provision of an equivalent amount of annual electricity output by the grid is the most likely baseline scenario.	OK
		Is it demonstrated/justified that the project activity itself is not a likely baseline scenario (e.g. through (a) a flow-chart or series of questions that lead to a narrowing of potential baseline options, (b) a qualitative or quantitative assessment of different potential options and an indication of why the non-project option is more likely, (c) a qualitative or quantitative assessment of one or more barriers facing the proposed project activity or (d) an indication that the project type is not common practice in the proposed area of implementation, and not required by a Party's legislation/regulations)?	/1/ /41/	DR	OK	<p>The project additionality is assessed by applying the "Tool for the demonstration and assessment of additionality " issued by EB.</p> <p>It was confirmed that the likely baseline scenario is a provision of an equivalent amount of electricity supplied by the grid.</p> <p>The project activity is confirmed to be additional.</p>	OK
(e)	Monitoring methodology.		/1/	DR	OK	The monitoring plan was prepared according to the monitoring methodology.	OK

VALIDATION REPORT

ID	Means of validation	CHECKLIST QUESTION	Ref.	MoV	Draft Concl.	COMMENTS	Final Concl.
(b) Applicability of the selected methodology to the project activity							
78. Based on documented evidence and corroborated by a site visit where required by paragraphs 59-62 above, the DOE shall determine whether the delineation in the PDD of the project boundary is correct and meets the requirements of the selected baseline methodology. The DOE also shall confirm that all sources and GHGs required by the methodology have been included within the project boundary. If the methodology allows project participants to choose whether a source or gas is to be included within the project boundary, the DOE shall determine whether the project participants have justified that choice. The DOE shall confirm that the justification provided is reasonable, based on assessment of supporting documented evidence provided by the project participants and corroborated by observations if required.							
(a)	Are the project’s spatial (geographical) boundaries clearly defined?	/1/	DR	OK	The proposed project is located along the Kuke River, a tributary of Nu jiang River in Changning County, Baoshan City, Yunnan Province, P. R. China. The project is located 51km from Changning County. The geographical coordinates of the plants are: east longitude of 98° 52’ 6” ~99° 46’ 48” and north latitude of 25° 28’ 51” ~26° 23’ 58” .	OK	
(b)	Are the project’s system (components and facilities used to mitigate GHGs) boundaries clearly defined?	/1/	DR	OK	Since this is a hydropower plant project, it uses a renewable energy source and decreases GHG emissions as an alternative to power generation facilities that would use fossil fuels. South China Power Grid is defined.	OK	
(d) .Baseline identification							
83. The DOE shall determine whether the baseline scenario identified is reasonable by validating the assumptions, calculations and rationales used, as described in the PDD							
(a)	It shall ensure that documents and sources referred to in the PDD are correctly quoted and interpreted.	/1/ /22/	DR I	CAR3	References in the PDD were checked and confirmed that not invalid, but those references were appropriately corrected.	OK	
(b)	The DOE shall cross check the information provided in the PDD with other verifiable and credible sources, such as local expert opinion, if available.	/1/ all	DR I	OK	PDD was prepared based on the approved FSR and EIA by local experts.	OK	
84	(i)The DOE shall determine whether all applicable CDM requirements have been taken into account in the identification of the baseline scenario for the proposed CDM project activity, including “relevant national and/or sectoral policies and circumstances.” Drawing on its knowledge of the sector and/or advice from local experts,	/1/	DR I	OK	It is confirmed in the interview that the hydropower electricity generation is enhanced. It is also confirmed that the baseline scenario is fulfilled the relevant national / sectoral policies and requirements reflected to the PDD.	OK	
	(i i)The DOE shall confirm that all relevant policies and circumstances have been identified and correctly considered in the PDD, in accordance with the guidance by the CDM Executive Board.	/1/	DR I	OK	Refer to above.	OK	
(e) Algorithms and/or formulae used to determine emission reductions							
89	(i) The DOE shall determine whether the equations and parameters in the PDD have been correctly applied by comparing them to those in the selected approved methodology.	/1/	DR	OK	Confirmed with the methodology that those are correctly applied.	OK	

VALIDATION REPORT

ID	Means of validation	CHECKLIST QUESTION	Ref.	MoV	Draft Concl.	COMMENTS	Final Concl.
		(i i) If the methodology provides for selection between different options for equations or parameters, the DOE shall confirm that adequate justification has been provided (based on the choice of the baseline scenario, context of the proposed CDM project activity and other evidence provided) and that the correct equations and parameters have been used, in accordance with the methodology selected.	/1/	DR	OK	The original emission factor issued by NDRC in July 2008 was used in the PDD. A revised version was then issued in Dec. 2008 and the previous data was withdrawn. Since the original data was unavailable, the updated factor issued in Dec. 2008 was used.	OK
90		(i) The DOE shall verify the justification given in the PDD for the choice of data and parameters used in the equations.	/1/	DR	OK	The newest data prepared by the Chinese government and issued on 30/12/2008 was used to calculate the emission factor.	OK
		(ii) If data and parameters will not be monitored throughout the crediting period of the proposed CDM project activity but have already been determined and will remain fixed throughout the crediting period, the DOE shall assess that all data sources and assumptions are appropriate and calculations are correct, applicable to the proposed CDM project activity and will result in a conservative estimate of the emission reductions.	/1/	DR	OK	The emission factor applied was verified against publically available data, such as government data and guidance.	OK
		(iii) If data and parameters will be monitored on implementation and hence become available only after validation of the project activity, the DOE shall confirm that the estimates provided in the PDD for these data and parameters are reasonable.	-	-	-	N/A	-
96. Additionality of a project activity							
(a) Prior consideration of the clean development mechanism							
97. The DOE shall confirm that the start date of the project activity, reported in the PDD, is in accordance with the "Glossary of CDM terms". If the reported date is not in accordance with the glossary, the DOE shall raise a CAR to ensure that the start date is correctly reported in a revised PDD. In particular, for project activities that require construction, retrofit or other modifications, the date of commissioning cannot be considered the project activity start date.							
(a)		Are the project's starting date and operational lifetime clearly defined and reasonable?	/17/	I	OK	The starting date of the project was on 06 November 2007. This was the project construction started. The project the operational lifetime is defined as 30 years operation period.	OK
(b)		Is the assumed crediting time clearly defined and reasonable (renewable crediting period of max. two x 7 years or fixed crediting period of max. 10 years)?	/1/	DR I	CAR2 CAR12	Because of the procedural delay, the starting date of renewable crediting period revised as well as the total renewable crediting period. Renewable crediting period – 7x3 years. Crediting start date is mentioned to be 01/02/2010. The crediting periods are not inconsistent in both the excel spreadsheet of IRR calculation and the table of Section A.4.4. Those excel spreadsheets were revised and the PPD was corrected. DOE found that the necessary information was added to the	OK

VALIDATION REPORT

ID	Means of validation	CHECKLIST QUESTION	Ref.	MoV	Draft Concl.	COMMENTS	Final Concl.
						revised PDD, and the modification was clear.	
98	The DOE, in accordance with the guidance from the Board, shall determine whether it is a new project activity (project activities with starting date on or after 02 August 2008) or an existing project activity (project activities with a start date before 02 August 2008).		/1/	DR I	OK	The project is an existing project activity with a start date before 02 August 2008.	OK
100. For an existing project activity with a start date before 2 August 2008, for which the start date is prior to the date of publication of the PDD for global stakeholder consultation, the DOE shall assess the project participant's prior consideration of the CDM through document reviews and shall satisfy following requirements:							
(a)	Evidence that must indicate that awareness of the CDM prior to the project activity start date, and that the benefits of the CDM were a decisive factor in the decision to proceed with the project. Evidence to support this would include, inter alia, minutes and/or notes related to the consideration of the decision by the Board of Directors, or equivalent, of the project participant, to undertake the project as a proposed CDM project activity.		/1/	DR I	OK	The FSR for this project was developed in September 2006 and approved by the Baoshan City Development and Reform Commission on 22/01/2007. The FSR indicated that the project was not financially attractive. Then the project owner recognized CDM and decided to develop it as CDM project at the Board meeting held on 05/04/2007. The idea of CDM was raised and the project participant succeeded in initiating the project as bank agreed to invest to the project. These were confirmed in an interview with staff and owner during on-site visit. As a reliable source of evidence, regarding the consideration of CDM project, and the permission for starting construction issued by Changning Development and Reform Commission dated on 06/11/2007 was confirmed.	OK
(b)	Reliable evidence from project participants that must indicate that continuing and real actions were taken to secure CDM status for the project in parallel with its implementation. Evidence to support this should include, inter alia, contracts with consultants for CDM/PDD/methodology services, Emission Reduction Purchase Agreements or other documentation related to the sale of the potential CERs (including correspondence with multilateral financial institutions or carbon funds), evidence of agreements or negotiations with a DOE for validation services, submission of a new methodology to the CDM Executive Board, publication in newspaper, interviews with DNA, earlier correspondence on the project with the DNA or the UNFCCC secretariat.		/1/ /8/ /30/	DR I	OK	It is confirmed that the Certified Emission Reduction Purchase Agreements between Changning County Jia Yuan Power Development Co., Ltd. and Mitsubishi Corporation was made on 13/05/2008.	OK
(b) Identification of alternatives							
104. The DOE shall assess the list of alternatives given in the PDD and ensure that:							

VALIDATION REPORT

ID	Means of validation	CHECKLIST QUESTION	Ref.	MoV	Draft Concl.	COMMENTS	Final Concl.
(a)		The list of alternatives includes as one of the options that the project activity is undertaken without being registered as a proposed CDM project activity;	/1/	DR I	OK	Yes	OK
(b)		The list contains all plausible alternatives that the DOE, on the basis of its local and sectoral knowledge, considers to be a viable means of supplying the outputs or services that are to be supplied by the proposed CDM project activity;	/1/	DR I	OK	The following alternatives are confirmed in the PDD: 1. The proposed project not undertaken as a CDM project activity; 2. Construction of a coal-fired power plant with equivalent installed capacity or annual electricity generation; 3. Construction of a new power plant from other renewable sources with equivalent annual electricity generation connected to the grid 4. Equivalent electricity service provided by the South China Power Grid.	OK
(c)		The alternatives comply with all applicable and enforced legislation.	/1/ /19/	DR I	OK	According to current laws and regulations of China, construction of coal-fired power plants with installed capacity below 135 MW, if without special permission, are strictly prohibited in large layered grids (Alternative 2).	OK
(c) Investment analysis							
108. The DOE shall comply with the latest version of the “Guidance on the Assessment of Investment Analysis” as provided by the CDM Executive Board							
General Issues in calculation and presentation							
3		The period of assessment should not be limited to the crediting period of the project activity. Both project IRR and equity IRR calculations shall as a preference reflect the period of expected operation of the underlying project activity(technical lifetime).	/34/	DR I	CAR7	The period of assessment is 33 years (construction period: 3 years, operational period: 30 years). It is demonstrated that “Operational lifetime of the project activity” is 30 years which is based on Feasibility Study Report. IRR analysis is evaluated in a period of 33 year. Originally, CER revenue accounted for 30 years, but has been corrected to 21 years.	OK
		The IRR calculation may include the cost of major maintenance and/or rehabilitation if these are expected to be incurred during the period of assessment.	/34/	DR I	OK	Yes. Maintenance cost was included in the cost of operation (29.57 million Yuan).	OK
4		The fair value of any project activity assets at the end of the assessment period should be included as a cash inflow in the final year.	/34/	DR I	OK	Yes. “Residue value of fixed assets” (0 million Yuan) and “Collected working capital” (0.19 million Yuan) were included as a cash inflow in the final year.	OK
		The fair value should be calculated in accordance with local accounting regulations where available, or international best practice. It is expected that such fair value calculations will include both the book value	/34/	DR I	CL12 CAR6	The consulting side initially suggested using international best practice for the calculation of residue value of fixed assets. Project owner & author of FSR believed that the cost of recovering	OK

VALIDATION REPORT

ID	Means of validation	CHECKLIST QUESTION	Ref.	MoV	Draft Concl.	COMMENTS	Final Concl.
		of the asset and the reasonable expectation of the potential profit or loss on the realization of the assets.				fixed assets may be even more than the residue value of fixed assets. Therefore residue value of fixed assets as zero was included in the FSR, which is not against local accounting regulations. In the FSR, the residue value is 0% and depreciation is 25 years. It is necessary to be explained why it has been changed in the PDD. The fixed assets calculation (5% residue value, 30 years of depreciation) was chosen by the experience of the other project. The PP revised the PDD and IRR sheet consistent with the FSR. The excel file of IRR sheet submitted by the PP is confirmed that it is corrected appropriately in accordance with the content of PDD.	
5		Depreciation, and other non-cash items related to the project activity, which have been deducted in estimating gross profits on which tax is calculated, should be added back to net profits for the purpose of calculating the financial indicator (e.g. IRR, NPV).	/34/	DR I	OK	Yes. Depreciation has been taken into consideration in the IRR analysis.	OK
		Taxation should only be included as an expense in the IRR/NPV calculation in cases where the benchmark or other comparator is intended for post-tax comparisons.	/34/	DR I	OK	Yes. Taxation was included as the expense of IRR calculation.	OK
6		Input values used in all investment analysis should be valid and applicable at the time of the investment decision taken by the project participant. The DOE is therefore expected to validate the timing of the investment decision and the consistency and appropriateness of the input values with this timing. The DOE should also validate that the listed input values have been consistently applied in all calculations.	/34/	DR I	CAR3	Input values used in all investment analysis are confirmed based on FSR. It, however, some data were found to be incorrect by compared with the PDD. DOE found that it is demonstrated clearly. The FSR for the project was approved by the Baoshan City Development and Reform Commission. CER price based on ERPA.	OK
7		In the case of project activities for which implementation ceases after the commencement and where implementation is recommenced due to consideration of the CDM the investment analysis should reflect the economic decision making context at the point of the decision to recommence the project. Therefore capital costs incurred prior to the revised project activity start date can be reflected as the recoverable value of the assets. (Capital expenditures should be included not at the original investment costs but at the market fair value at the point of the decision to proceed with the investment, demonstrating the value through assessments done by chartered specialists).	-	-	-	N/A	-
8		Project participants should supply spreadsheet versions of all investment analysis. All formulas used in this analysis	/34/	DR I	CAR4	The spreadsheet versions of all investment analysis were supplied. All the formulas and cells were	OK

VALIDATION REPORT

ID	Means of validation	CHECKLIST QUESTION	Ref.	MoV	Draft Concl.	COMMENTS	Final Concl.
	are readable and all relevant cells are viewable and unprotected. The spreadsheet will be made available to the Executive Board, UNFCCC secretariat and others contracted to assess the request for registration on behalf of the Board including assigned members of the Registration and Issuance Team.					viewable, without protection. However calculation errors found during the assessment were corrected appropriately.	
Specific Guidance on the Calculation of Project IRR and Equity IRR							
9	The cost of financing expenditures (i.e. loan repayments and interest) should not be included in the calculation of project IRR.	/34/	DR I	OK		The cost of financing expenditures is not included in the calculation of IRR.	OK
10	In the calculation of equity IRR only the portion of investment costs which is financed by equity should be considered as the net cash outflow, the portion of the investment costs which is financed by debt should not be considered a cash outflow.	-	-	-		N/A	-
Selection and Validation of Appropriate Benchmarks							
11	In cases where a benchmark approach is used the applied benchmark shall be appropriate to the type of IRR calculated. Local commercial lending rates or weighted average costs of capital (WACC) are appropriate benchmarks for a project IRR. Required/expected returns on equity are appropriate benchmarks for an equity IRR.	/34/	DR I	OK		Yes. The applied benchmark and calculated IRR have been used on a project IRR basis.	OK
	Benchmarks supplied by relevant national authorities are also appropriate if the DOE can validate that they are applicable to the project activity and the type of IRR calculation presented.	/34/	DR I	OK		The Chinese government's Economic Evaluation Code for Small Hydropower Project (SL16-95) recognizes 10% as the official rate of return benchmark. The benchmark for this project is 10%.	OK
12	In the cases of projects which could be developed by an entity other than the project participant, the benchmark should be based on publicly available data sources which can be clearly validated by the DOE. Such data sources may include local lending and borrowing rates, equity indices, or benchmarks determined by relevant national authorities. The DOE's validation of such benchmarks shall also include its opinion of the suitability of the benchmark applied in the context of the underlying project activity.	-	-	-		N/A	-
13	Internal company benchmarks/expected returns (including those used as the expected return on equity in the calculation of a weighted average cost of capital – WACC), should only be applied in cases where there is only one possible project developer and should be demonstrated to have been used for similar projects with similar risks, developed by the same company or, if the company is brand new, would have been used for similar projects in the same sector in the country/region.	-	-	-		N/A	-

VALIDATION REPORT

ID	Means of validation	CHECKLIST QUESTION	Ref.	MoV	Draft Concl.	COMMENTS	Final Concl.
		This shall require as a minimum clear evidence of the resolution by the company's Board and/or shareholders and will require the validating DOE to undertake a thorough assessment of the financial statements of the project developer – including the proposed WACC – to assess the past financial behavior of the entity during at least the last 3 years in relation to similar projects.	-	-	-	N/A	-
14		Risk premiums applied in the determination of required returns on equity shall reflect the risk profile of the project activity being assessed, established according to national/international accounting principles. It is not considered reasonable to apply the rate general stock market returns as a risk premium for project activities that face a different risk profile than an investment in such indices.	-	-	-	N/A	-
Investment comparison analysis and benchmark analysis							
15		If the proposed baseline scenario leaves the project participant no other choice than to make an investment to supply the same (or substitute) products or services, a benchmark analysis is not appropriate and an investment comparison analysis shall be used. If the alternative to the project activity is the supply of electricity from a grid this is not to be considered an investment and a benchmark approach is considered appropriate.	-	-	-	N/A	-
Sensitivity analysis							
16		Only variables, including the initial investment cost, that constitute more than 20% of either total project costs or total project revenues should be subjected to reasonable variation (all parameters varied need not necessarily be subjected to both negative and positive variations of the same magnitude). The results of this variation should be presented in the PDD and be reproducible in the associated spreadsheets. Where a DOE considers that a variable which constitutes less than 20% has a material impact on the analysis, it shall raise a corrective action request to include this variable in the sensitivity analysis.	/39/	DR I	CAR5	Sensitivity analysis is shown using 4 variables, namely “Fixed asset investment”, “Annual O&M cost”, “Expected tariff (excl. VAT)”, and “Annual electricity output”, the results of this variation was recorded in the PDD. However calculation errors (double counting etc.) found during the assessment were corrected appropriately.	OK
17		The DOE should assess in detail whether the range of variations is reasonable in the project context. Past trends may be a guide to determine the reasonable range. As a general point of departure variations in the sensitivity analysis should at least cover a range of +10% and -10%, unless this is not deemed appropriate in the context of the specific project circumstances.	/39/	DR I	OK	Variations in the sensitivity analysis are covering a range of -10% ~ +10%.	OK
		In cases where a scenario will result in the project activity passing the benchmark or becoming the most financially attractive	/39/	DR I	OK	The result of the sensitivity analysis does not exceed the benchmark.	OK

VALIDATION REPORT

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		alternative, the DOE shall provide an assessment of the probability of the occurrence of this scenario in comparison to the likelihood of the assumptions in the presented investment analysis, taking into consideration correlations between the variables as well as the specific socio-economic and policy context of the project activity.					
(d) Barrier analysis							
115. The DOE shall apply a two-step process to assessing the barrier analysis performed, as follows:							
(a) Determine whether the barriers are real.							
(i)		The DOE shall assess the available evidence and/or undertake interviews with relevant individuals (including members of industry associations, government officials or local experts if necessary) to determine whether the barriers listed in the PDD exist.	/1/	DR I	OK	IRR test was selected. Barrier analysis was omitted as in accordance with the Methodological Tool, EB39 Annex10 (Ver. 05.2).	OK
(ii)		The DOE shall ensure that existence of barriers is substantiated by independent sources of data such as relevant national legislation, surveys of local conditions and national or international statistics.	/1/ /18/	DR I	OK	Taken into consideration by Baoshan City Wanrun Hydro & Power Survey Design Institute and clearly demonstrated in the financial analysis. The data therefore is objective.	OK
(iii)		If existence of a barrier is substantiated only by the opinions of the project participants, the DOE shall not consider this barrier to be adequately substantiated. If the DOE considers, on the basis of its sectoral or local expertise, that a barrier is not real or is not supported by sufficient evidence, it shall raise a CAR to have reference to this barrier removed from the project documentation;	-	-	-	N/A	-
115. (b) Determine whether the barriers prevent the implementation of the project activity but not the implementation of at least one of the possible alternatives.							
(i)		Since not all barriers present an insurmountable hurdle to a project activity being implemented, the DOE shall apply its local and sectoral expertise to judge whether a barrier or set of barriers would prevent the implementation of the proposed CDM project activity and would not equally prevent implementation of <i>at least one of</i> the possible alternatives, in particular the identified baseline scenario.	/1/	DR I	OK	“Provision of an equivalent amount of annual electricity output by grid” is not equally preventing implementation of at least one of the possible alternatives.	OK
(e) Common practice analysis							
118. The DOE shall use its local and sectoral expertise to:							
(a)		Assess whether the geographical scope (e.g. the defined region) of the common practice analysis is appropriate for the assessment of common practice related to the project activity's technology or industry type. For certain technologies the relevant region for assessment will be local and for others it may be transnational/global. If a region other than the entire host country is chosen, the DOE shall assess the explanation why this region is more appropriate;	/1/	DR I	OK	The following criteria were selected and applied in the PDD: 1. Similar scale: 10-50MW 2. Same area: Yunnan province 3. Similar investment environment: Constructed after 2002 4. Projects not applying CDM	OK

VALIDATION REPORT

ID	Means of validation	CHECKLIST QUESTION	Ref.	MoV	Draft Concl.	COMMENTS	Final Concl.
(b)		Using official sources and local and industry expertise, determine to what extent similar and operational projects (e.g., using similar technology or practice), other than CDM project activities, have been undertaken in the defined region;	/1/ /22/	DR I	CAR8	Data source was not indicated appropriately in the PDD. The common practice analysis in the PDD was entirely revised. The selection was made by following such important criteria. Data source utilized to select for common practice was Almanac of China's Water Power 2006 edition and various applicable internet resources.	OK
(c)		If similar and operational projects, other than CDM project activities, are already "widely observed and commonly carried out" in the defined region, assess whether there are essential distinctions between the proposed CDM project activity and the other similar activities.	/1/	DR I	OK	Hydropower projects in this area are not widely observed.	OK
7. Monitoring plan							
121. The DOE shall apply a two-step process to assessing compliance with this requirement, as follows:							
(a)	Compliance of the monitoring plan with the approved methodology. The DOE shall: (i) By means of document review, identify the list of parameters required by the selected approved methodology;	Is the monitoring methodology previously approved by the CDM Methodology Panel?	/1/ /42/	DR I	OK	Yes. "Consolidated baseline methodology for grid-connected electricity generation from renewable sources (ACM0002 / Version 08, Sectoral Scope 01, EB44)" is applied. Refer to ID#67(a).	OK
		Is the monitoring methodology applicable for this project and is the appropriateness justified?	/1/ /42/	DR I	OK	The project is the grid-connected renewable power generation (hydro sources) project activity. Refer to ID#67(a).	OK
		Does the monitoring methodology reflect good monitoring and reporting practices?	/1/ /2/ /10/ /18/	DR I	OK	The electricity generated delivering to the SCPG will be directly monitored. This reflects good practice.	OK
		Is the discussion and selection of the monitoring methodology transparent?	/1/ /42/	DR I	OK	Yes.	OK
	(ii) Confirm that the monitoring plan contains all necessary parameters, that they are clearly described and that the means of monitoring described in the plan complies with the requirements of	【Project emission】 Does the monitoring plan provide for the collection and archiving of all relevant data necessary for estimation or measuring the greenhouse gas emissions within the project boundary during the crediting	/1/ /14/ /21/	DR I	CL10	There are no emissions from the project activity as power density is $1,125\text{W/m}^2$, which is bigger than 10W/m^2 . Receiving electricity are measured with main-, and backup- meters. Emission factor is in accordance with the data issued by NDRC. The evidential document regarding	OK

VALIDATION REPORT

ID	Means of validation	CHECKLIST QUESTION	Ref.	MoV	Draft Concl.	COMMENTS	Final Concl.
	the methodology;	period?				water flow was provided. It, however, was actually the data of average water flow over time. The data is actually available from 1960 to 2000. However, the trend of short period (1962-1982) is same as the whole period (1960-2000). Therefore, the short period of data is utilized and analyzed the water flow for this project. It is confirmed that the answer was also identified in the FSR.	
		【Project emission】 Are the choices of project GHG indicators reasonable?	/1/	DR I	-	Refer to ID#121(a)(i)	OK
		【Project emission】 Will it be possible to monitor / measure the specified project GHG indicators?	/1/	DR I	-	Refer to ID#121(a)(i)	OK
		【Project emission】 Will the indicators give opportunity for real measurements of achieved emission reductions?	/1/	DR I	-	Refer to ID#121(a)(i)	OK
		【Project emission】 Will the indicators enable comparison of project data and performance over time?	/1/	DR I	-	Refer to ID#121(a)(i)	OK
		【Project Leakage】 Does the monitoring plan provide for the collection and archiving of all relevant data necessary for determining leakage?	/1/ /42/	DR I	OK	There are no need to consider leakage in applying this methodology.	OK
		【Project Leakage】 Have relevant indicators for GHG leakage been included?	/1/	DR I	OK	Refer to above.	OK
		【Project Leakage】 Does the monitoring plan provide for the collection and archiving of all relevant data necessary for determining leakage?	/1/	DR I	OK	Refer to above.	OK
		【Project Leakage】 Will it be possible to monitor the specified GHG leakage indicators?	/1/	DR I	OK	Refer to above.	OK

VALIDATION REPORT

ID	Means of validation	CHECKLIST QUESTION	Ref.	MoV	Draft Concl.	COMMENTS	Final Concl.
(b)	Implementation of the plan. The DOE shall, by means of review of the documented procedures, interviews with relevant personnel, project plans and any physical inspection of the proposed CDM project activity site in accordance with paragraphs 59-62, assess whether: (i) The monitoring arrangements described in the monitoring plan are feasible within the project design; (ii) The means of implementation of the monitoring plan, including the data management and quality assurance and quality control procedures, are sufficient to ensure that the emission reductions achieved by/resulting from the proposed CDM project activity can be reported ex post and verified.	【Baseline emission】 Does the monitoring plan provide for the collection and archiving of all relevant data necessary for determining baseline emissions during the crediting period?	/1/ /10/	DR I	CAR9	Notation system of the year and the share seem not be matched. Please check and correct it appropriately. Please submit the evidential documents of the share of the low-cost/must run resources in the China Southern Power Grid (2002-2006)". → The notation system of the low-cost/must run resources was corrected in the PDD. The evidential document was also submitted. The project uses the ex-ante determination of an emission factor for grid electricity. Therefore, the electric power generation by the hydropower plant is reasonable for the project emission indicator.	OK
		【Baseline emission】 Is the choice of baseline indicators, in particular for baseline emissions, reasonable?	/1/ /42/	DR I	OK	The baseline emissions and other baseline indicators are reasonably chosen in line with ACM0002.	OK
		【Baseline emission】 Will it be possible to monitor the specified baseline indicators?	/1/	DR I	OK	The electricity generated will be monitored directly. Monitoring points are described in PDD.	OK
		Is the authority and responsibility of project management clearly described?	/1/	DR	OK	All responsibility for daily monitoring and reporting lies with the Project owner. The Project owner will assign a monitoring team.	OK
		Is the authority and responsibility for registration, monitoring, measurement and reporting clearly described?	/1/	DR	CL1 CL2	It is necessary to add the brief explanation how you plan to collect and archive relevant data (such as number of accident, number of tourists, traffic volume, public safety, etc.) of social & economic impacts not only environmental impact stated in the Monitoring Plan in the end of B.7.2. Deloitte-TECO confirmed that the PDD was corrected appropriately. It is confirmed that the monitoring manual (draft) is newly prepared by the project owner.	OK
		Are procedures identified for training of monitoring personnel?	/1/ /15/ /37/	DR	CL6	There was no description/explanation of such initial training for monitoring personnel in the PDD. However, the description of monitoring personnel training is added in the section B.7.2. Refer to ID 59 (d).	OK
		Are procedures identified for emergency preparedness for cases where emergencies can cause unintended emissions?	/1/	DR	OK	No emergency situation which could result in unintended emissions can be expected in the project.	OK

VALIDATION REPORT

ID	Means of validation	CHECKLIST QUESTION	Ref.	MoV	Draft Concl.	COMMENTS	Final Concl.
		Are procedures identified for calibration of monitoring equipment?	/1/	DR	CL7 CL9	It is important to clarified that the project owner owns both main and sub meters. It is also necessary to describe the procedure of inaccuracy analysis in the monitoring manual and the meters fulfilled the requirement of the national standards. The procedures for calibration of the monitoring equipment and installations are identified to keep the sufficient accuracy within 0.5% for meters installed in the substation and at the hydropower station.	OK
		Are procedures identified for maintenance of monitoring equipment and installations?	/1/ /18/	DR	CL8	The procedural manual of maintenance of monitoring equipment and installations including the procedure of daily data recording (what to record, where to keep records, any written manual of it) needed to prepare toward the operation. It was necessary to describe in the PDD that this manual will be made. The project owner will prepare this manual in detail when all of facilities will be fixed and the demand of equipment was clear. It is confirmed that the relevance sentences were added in the PDD.	OK
		Are procedures identified for monitoring, measurements and reporting?	/1/ /37/	DR	CL2	It is necessary to prepare the monitoring manual toward the operation. The project owner planned to prepare the draft manual in detail when all of facilities were fixed and the demand of equipment was clear. The monitoring manual (draft) was prepared and submitted.	OK
		Are procedures identified for day-to-day records handling (including what records to keep, storage area of records and how to process performance documentation)	/1/	DR	OK	Procedures for day-to-day records handling is clearly described in the PDD. In the PDD it is described that all data collected as part of monitoring will be archived electronically every ten days. All information will be stored by the plant manager and material will have hard copy for backup every ten days. In order to facilitate auditors' reference of relevant literature relating to the project, the project materials and monitoring results will be indexed. And all data including calibration records are kept until 2 years after the end of the total credit time of the CDM project.	OK
		Are procedures identified for dealing with possible	/1/	DR	OK	Procedures for dealing with possible monitoring data adjustments and uncertainties are identified.	OK

VALIDATION REPORT

ID	Means of validation	CHECKLIST QUESTION	Ref.	MoV	Draft Concl.	COMMENTS	Final Concl.
		monitoring data adjustments and uncertainties?					
		Are procedures identified for review of reported results/data?	/1/	DR	OK	Procedure for review of reported results/data is described in the PDD.	OK
		Are procedures identified for internal audits of GHG project compliance with operational requirements where applicable?	/1/	DR	CL3	It is necessary to add and describe about the internal audit in the figure of monitoring structure. It is confirmed that procedure for internal audits of GHG project compliance is described in the PDD.	OK
		Are procedures identified for project performance reviews before data is submitted for verification, internally or externally?	/1/	DR	CL4	Based on the interview to the project owner, it is considered that the review procedure of project performance externally by the grid company shall be described. It is confirmed that procedure for project performance reviews before data submission is described in the PDD.	OK
		Are procedures identified for corrective actions in order to provide for more accurate future monitoring and reporting?	/1/	DR	CL5	It is necessary to describe that the procedure of corrective action for improvement of monitoring & reporting methods in the monitoring plan of the PDD. The PDD is revised and the procedure for corrective actions with the Project owner and the grid company is described appropriately.	OK
8. Sustainable development							
123	CDM project activities shall assist Parties not included in Annex I to the Convention in achieving sustainable development.						
124	The DOE shall determine whether the letter of approval by the DNA of the host Party confirms the contribution of the proposed CDM project activity to the sustainable development of the host Party.	/1/ /6/ /35/	DR	OK		Contribution of the project activity to sustainable development of the host country was confirmed via the LoA from China.	OK
9. Local stakeholder consultation							
127. The DOE shall, by means of document review and interviews with local stakeholders as appropriate, determine whether:							
(a)	Comments by local stakeholders that can reasonably be considered relevant for the proposed CDM project activity, have been invited;	Have relevant stakeholders been consulted?	/1/ /25/	DR I	OK	The project owner conducted a questionnaire survey of local villagers and residents as well as local governments in order to learn about the public's opinions and suggestions on the project.	OK
		Have appropriate media been used to invite comments by local stakeholders?	/1/ /25/	DR I	OK	The direct communication (interview and questionnaire) has been used to invite comments by stakeholders.	OK
		If a stakeholder consultation process is required by regulations/laws in the host country, has the	/1/ /3/ /25/ /31/	DR I	OK	It is confirmed that a stakeholder consultation process is required by Chinese EIA regulations.	OK

VALIDATION REPORT

ID	Means of validation	CHECKLIST QUESTION	Ref.	MoV	Draft Concl.	COMMENTS	Final Concl.
		stakeholder consultation process been carried out in accordance with such regulations/laws?					
(b)	The summary of the comments received as provided in the PDD is complete;	Is a summary of the stakeholder comments received provided?	/1/ /25/	DR	OK	Yes, it is available in the Section E.1. of the PDD. A stakeholder list and all questionnaires are provided to Deloitte-TECO.	OK
		Has due account been taken of any stakeholder comments received?	/1/ /25/	DR I	OK	Yes. The relevant measures have been taken by the project developer and all 30 questionnaires were collected.	OK
(c)	The project participants have taken due account of any comments received and have described this process in the PDD.		/1/	DR I	OK	To promote the good environmental conditions in this area, the PP took countermeasures listed in EIA taking into account of stakeholder's opinions.	OK
10. Environmental impacts							
129	Project participants shall submit documentation to the DOE on the analysis of the environmental impacts of the project activity in accordance with paragraph 37(c) of the CDM modalities and procedures						
130	The DOE shall confirm, by means of a document review and/or using local official sources and expertise, whether the project participants have undertaken an analysis of environmental impacts and, if required by the host Party, an environmental impact assessment.	Has an analysis of the environmental impacts of the project activity been sufficiently described?	/1/ /3/ /14/ /24/ /31/	DR I	OK	The impacts on ecosystem, dust and air quality, noise, wastewater and sewage, land use, and solid waste are elaborated in the PDD.	OK
		Are there any Host Party requirements for an Environmental Impact Assessment (EIA), and if yes, is an EIA approved?	/1/ /3/ /5/	DR I	OK	The Environmental Impact Assessment Report of the Project prepared by the Yunnan University was approved by the Changning County Environmental Protection Bureau on 28/12/2006.	OK
		Will the project create any adverse environmental effects?	/1/ /3/	DR I	OK	The PDD stated that the Project will not likely result any significant environmental impacts.	OK
		Are transboundary environmental impacts considered in the analysis?	/1/ /3/	DR I	OK	There are no foreseen transboundary environmental impacts from the project.	OK
		Have identified environmental impacts been addressed in the project design?	/1/ /3/ /5/	DR	OK	According to the results of EIA and the reply from the Environmental Protection Bureau, the impacts on the environment are not significant.	OK
		Does the project comply with environmental legislation in the host country?	/1/ /3/ /5/	DR	OK	The Project meets all the national environmental protection regulations.	OK

VALIDATION REPORT

Table A3 Resolution of Corrective Action and Clarification Requests**Project title: Changning Kawan 18.9MW Hydroelectric Project**

CAR: Corrective action requested, CL: Clarification requested.

ID	Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in Table A2	Summary of project owner response	Validation team conclusion
CAR1	"Rated water flow" stated as 10.6m ³ /s in the PDD. It, however, is 10.54m ³ /s in the FSR. Please correct it in the PDD in accordance with its description of the FSR.	58	The data were checked and confirmed with the FSR. The correction was made in the PDD by following the FSR.	DOE found that the necessary correction was made in the revised PDD. This CAR is now closed.
CAR2	The crediting period shall be revised due to the delay in construction.	97 (b)	Because of the procedural delay, the starting date of renewable crediting period revised as well as the total renewable crediting period. Renewable crediting period – 7×3 years. Crediting start date is mentioned to be 01/02/2010.	DOE found that it is demonstrated clearly. This CAR can be closed.
CAR3	Input values used in all investment analysis are confirmed that it was based on FSR. It, however, some data were found to be incorrect by compared with the PDD.	83 (a)	All input data were checked with FSR as well as PDD.	DOE found that it is demonstrated clearly. This CAR can be closed.
CAR4	The spreadsheet versions of all investment analysis were supplied. All the formulas and cells were viewable, without protection. However calculation errors found. Please also add calculation equation of Interest in the sheet of cost analysis.	8	Excel spreadsheet was revised.	Calculation errors were corrected appropriately. This CAR can be closed.
CAR5	Sensitivity analysis is shown using 4 variables, namely "Fixed asset investment", "Annual O&M cost", "Expected tariff (excl. VAT)", and "Annual electricity output", the results of this variation was recorded in the PDD. However calculation errors (double counting etc.) were found in "Material Cost" and "Other Cost".	108-16	Excel spreadsheet was revised.	Calculation errors were corrected appropriately. This CAR can be closed.
CAR6	In the FSR, the residue value is 0% and depreciation is 25	108-4	The fixed assets calculation (5% Residue Value, 30 years of	The excel file of IRR sheet submitted by the PP is

VALIDATION REPORT

ID	Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in Table A2	Summary of project owner response	Validation team conclusion
	years. Please explain why it has been changed in the PDD. Please submit evidential document of fixed assets calculation method (5% Residue Value, 30 years of depreciation)		depreciation) was chosen by the experience of the other project. The PP revised PDD and IRR sheet consistent with FSR.	confirmed that it is corrected appropriately in accordance with the content of PDD. This CAR can be closed.
CAR7	The period of assessment is 33 years (construction period: 3 years, operational period: 30 years). It is demonstrated that "Operational lifetime of the project activity" is 30 years which is based on FSR. IRR analysis is evaluated in a period of 33 year.	108-3	Originally, CER revenue accounted for 30 years, but has been corrected to 21 years.	It is confirmed that the necessary correction was implemented by the project participant. This CAR can be closed.
CAR8	Regarding the common practice analysis, it is considered that eleven (11) projects are relatively too many and not well classified for selection based on the important criteria. Please consider the important criteria and select projects by following the criteria.	118 (b)	The common practice analysis in the PDD was entirely revised. The selection was made by following such important criteria.	It is confirmed that the necessary correction was implemented by the project participant. This CAR can be closed.
CAR9	Notation system of the year and the share seem not be matched. Please check and correct it appropriately. Please submit the evidential documents of the share of the low-cost/must run resources in the China Southern Power Grid (2002-2006)".	121 (b)	The notation system of the low-cost/must run resources was corrected in the PDD. The evidential document was also submitted.	It is confirmed that the necessary correction was implemented by the project participant. This CAR can be closed.
CAR10	Please add information of "installed capacity" in the PDD.	58	Information of "installed capacity" was added in the PDD.	It is confirmed that the necessary correction was implemented by the project participant. This CAR can be closed.
CAR11	Please add "country code of China" to the telephone number of the Project Participant in Annex 1. Please also correct the PPs' email addresses (changing to company email address).	52	PDD was revised.	It is confirmed that the relevance sentences are added in the PDD. This CL can be closed.

VALIDATION REPORT

ID	Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in Table A2	Summary of project owner response	Validation team conclusion
CAR12	The crediting periods are not inconsistent in both the excel spreadsheet of IRR calculation and the table of Section A.4.4..	97 (b)	Those excel spreadsheets were revised and the PPD was corrected.	DOE found that the necessary information was added to the revised PDD, and the modification was clear. This CAR can be closed.
CAR13	The project site is described by its geographical location but no name of river is stated in the PDD. Please indicate it appropriately in the PDD.	58	The project site is located along the Kuke River, which is a tributary of Nu jiang River. Those names are added in the PDD.	DOE found that the necessary information was added to the revised PDD, and the modification was clear. This CAR can be closed.
CL1	Please add the brief explanation how you plan to collect and archive relevant data (such as number of accident, number of tourists, traffic volume, public safety, etc.) of social & economic impacts not only environmental impact stated in the Monitoring Plan in the end of B.7.2.	121 (b)	PDD revised.	The correction was confirmed in the revised PDD. This CL can be closed.
CL2	Please prepare the monitoring manual toward the operation.	121 (b)	The project owner will prepare this manual in detail when all of facilities were fixed and the demand of equipment was clear.	The monitoring manual (draft) was prepared and submitted. This CL can be closed.
CL3	Please add and describe briefly about the internal audit in the figure of monitoring structure.	121 (b)	Description of the internal audit was added in the PDD.	The correction was confirmed in the revised PDD. This CL can be closed.
CL4	Please describe briefly the review procedure of project performance externally by the grid company.	121 (b)	Description of the review procedure was added in the PDD.	The correction was confirmed in the revised PDD. This CL can be closed.
CL5	Please describe briefly that the procedure of corrective action for improvement of monitoring & reporting methods will be a described in the monitoring plan in the PDD.	121 (b)	Description of the procedure of corrective action was added in the PDD.	The correction was confirmed in the revised PDD. This CL can be closed.
CL6	Please describe briefly a training of monitoring personnel and preparation of training manual in the monitoring plan in the PDD.	59 (d)	Description of the training of monitoring personnel was added in the PDD.	The correction was confirmed in the revised PDD. This CL can be closed.
CL7	Please describe in the PDD that the project owner owns	121 (b)	PDD was revised.	It is confirmed that the relevance sentences are added in

VALIDATION REPORT

ID	Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in Table A2	Summary of project owner response	Validation team conclusion
	both main and sub meters. After the purchase of meters, please describe the procedure of inaccuracy analysis in the monitoring manual.			the PDD. This CL can be closed.
CL8	Please prepare the procedural manual of maintenance of monitoring equipment and installations including the procedure of daily data recording (what to record, where to keep records, any written manual of it) toward the operation. Please describe in the PDD that this manual will be made.	121 (b)	The project owner will prepare this manual in detail when all of facilities will be fixed and the demand of equipment was clear. PDD was revised.	The procedural manual of maintenance for monitoring equipment and installations should be prepared before the starting date of operation of project. It is confirmed that the relevance sentences were added in the PDD. This CL can be closed.
CL9	Please describe briefly about the meters in the PDD that the meters you will purchase will fulfill the requirement of the national standards.	121 (b)	PDD was revised.	It is confirmed that the relevance sentences are added in the PDD. This CAR can be closed.
CL10	The evidential document regarding water flow was provided. It, however, was actually the data of average water flow over time. Please tell us how many years of back data were used.	121 (a)	The data is actually available from 1960 to 2000. However, the trend of short period (1962-1982) is same as the whole period (1960-2000). Therefore, the short period of data is utilized and analyzed the water flow for this project.	It is confirmed that the answer was also identified in the FSR. This CL can be closed.
CL11	The project title of the Letter of Approval (LoA) form Japanese DNA was not the same of it from Chinese DNA and the PDD. Please submit a copy (PDF) of a Letter of Approval (LoA) of Japanese DNA, as well as correct its discription in the PDD accordingly.	A.3.2.	The Project received a LoA by the Japanese DNA. DOE received the evidential document on 26 June, 2009.	The LoA of Japanese DNA was received and confirmed by the DOE. This CL can be closed.
CL12	The consulting side initially suggested using international best practice for the calculation of residue value of fixed assets. Project owner & author of FSR believed that the cost of recovering fixed	108-4	In the FSR, the residue value is 0% and depreciation is 25 years. It is necessary to be explained why it has been changed in the PDD. The fixed assets calculation (5% residue value, 30 years of depreciation) was chosen by the	The excel file of IRR sheet submitted by the PP is confirmed that it is corrected appropriately in accordance with the content of PDD. This CL can be closed.

VALIDATION REPORT

ID	Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in Table A2	Summary of project owner response	Validation team conclusion
	assets may be even more than the residue value of fixed assets. Therefore residue value of fixed assets as zero was included in the FSR, which is not against local accounting regulations.		experience of the other project. The PP revised the PDD and IRR sheet consistent with the FSR.	

VALIDATION REPORT

Appendix B: Qualifications

Name:	AIKOSHI, Hiromu
Type of audit:	<input checked="" type="checkbox"/> 1. CDM <input type="checkbox"/> 2. JI <input checked="" type="checkbox"/> 3. J-VETS <input type="checkbox"/> 4. EU-ETS
Status:	<input checked="" type="checkbox"/> 1. Lead Auditor <input type="checkbox"/> 2. Auditor <input type="checkbox"/> 3. Technical Expert
Scope of Expertise:	<input checked="" type="checkbox"/> 1. Energy industries (renewable-/non-renewable sources) <input type="checkbox"/> 2. Energy distribution <input checked="" type="checkbox"/> 3. Energy demand <input type="checkbox"/> 4. Manufacturing industry <input type="checkbox"/> 5. Chemicals <input checked="" type="checkbox"/> 6. Construction <input checked="" type="checkbox"/> 7. Transport and freight <input type="checkbox"/> 8. Mining/mineral production <input type="checkbox"/> 9. Metal production <input type="checkbox"/> 10. Fugitive emissions from fuels (solid, oil and gas) <input type="checkbox"/> 11. Fugitive emissions from production and consumption of halocarbons and sulphur hexafluoride <input type="checkbox"/> 12. Solvent use <input checked="" type="checkbox"/> 13. Waste handling and disposal <input type="checkbox"/> 14. Afforestation and reforestation <input type="checkbox"/> 15. Agriculture
Approved by:	INANAGA, Hiroshi, Chief Executive Officer of Deloitte-TECO

Name:	OTANI, Yuichi
Type of audit:	<input checked="" type="checkbox"/> 1. CDM <input type="checkbox"/> 2. JI <input checked="" type="checkbox"/> 3. J-VETS <input type="checkbox"/> 4. EU-ETS
Status:	<input type="checkbox"/> 1. Lead Auditor <input checked="" type="checkbox"/> 2. Auditor <input type="checkbox"/> 3. Technical Expert
Scope of Expertise:	<input checked="" type="checkbox"/> 1. Energy industries (renewable-/non-renewable sources) <input type="checkbox"/> 2. Energy distribution <input checked="" type="checkbox"/> 3. Energy demand <input checked="" type="checkbox"/> 4. Manufacturing industry <input type="checkbox"/> 5. Chemicals <input type="checkbox"/> 6. Construction <input type="checkbox"/> 7. Transport and freight <input type="checkbox"/> 8. Mining/mineral production <input type="checkbox"/> 9. Metal production <input type="checkbox"/> 10. Fugitive emissions from fuels (solid, oil and gas) <input type="checkbox"/> 11. Fugitive emissions from production and consumption of halocarbons and sulphur hexafluoride <input type="checkbox"/> 12. Solvent use <input checked="" type="checkbox"/> 13. Waste handling and disposal <input type="checkbox"/> 14. Afforestation and reforestation <input checked="" type="checkbox"/> 15. Agriculture
Approved by:	INANAGA, Hiroshi, Chief Executive Officer of Deloitte-TECO

VALIDATION REPORT

Name:	KASAI, Katsuya
Type of audit:	<input checked="" type="checkbox"/> 1. CDM <input type="checkbox"/> 2. JI <input checked="" type="checkbox"/> 3. J-VETS <input type="checkbox"/> 4. EU-ETS
Status:	<input type="checkbox"/> 1. Lead Auditor <input checked="" type="checkbox"/> 2. Auditor <input type="checkbox"/> 3. Technical Expert
Scope of Expertise:	<input type="checkbox"/> 1. Energy industries (renewable-/non-renewable sources) <input type="checkbox"/> 2. Energy distribution <input type="checkbox"/> 3. Energy demand <input checked="" type="checkbox"/> 4. Manufacturing industry <input checked="" type="checkbox"/> 5. Chemicals <input type="checkbox"/> 6. Construction <input type="checkbox"/> 7. Transport and freight <input type="checkbox"/> 8. Mining/mineral production <input type="checkbox"/> 9. Metal production <input type="checkbox"/> 10. Fugitive emissions from fuels (solid, oil and gas) <input type="checkbox"/> 11. Fugitive emissions from production and consumption of halocarbons and sulphur hexafluoride <input type="checkbox"/> 12. Solvent use <input checked="" type="checkbox"/> 13. Waste handling and disposal <input type="checkbox"/> 14. Afforestation and reforestation <input type="checkbox"/> 15. Agriculture
Approved by:	INANAGA, Hiroshi, Chief Executive Officer of Deloitte-TECO

Name:	SHI, Xueting
Type of audit:	<input checked="" type="checkbox"/> 1. CDM <input type="checkbox"/> 2. JI <input type="checkbox"/> 3. J-VETS <input type="checkbox"/> 4. EU-ETS
Status:	<input type="checkbox"/> 1. Lead Auditor <input checked="" type="checkbox"/> 2. Auditor <input checked="" type="checkbox"/> 3. Technical Expert
Scope of Expertise:	<input type="checkbox"/> 1. Energy industries (renewable-/non-renewable sources) <input type="checkbox"/> 2. Energy distribution <input type="checkbox"/> 3. Energy demand <input type="checkbox"/> 4. Manufacturing industry <input type="checkbox"/> 5. Chemicals <input type="checkbox"/> 6. Construction <input type="checkbox"/> 7. Transport and freight <input type="checkbox"/> 8. Mining/mineral production <input type="checkbox"/> 9. Metal production <input type="checkbox"/> 10. Fugitive emissions from fuels (solid, oil and gas) <input type="checkbox"/> 11. Fugitive emissions from production and consumption of halocarbons and sulphur hexafluoride <input type="checkbox"/> 12. Solvent use <input type="checkbox"/> 13. Waste handling and disposal <input type="checkbox"/> 14. Afforestation and reforestation <input type="checkbox"/> 15. Agriculture
Approved by:	INANAGA, Hiroshi, Chief Executive Officer of Deloitte-TECO

VALIDATION REPORT

Name:	HAYASHI, Toshio
Type of audit:	<input checked="" type="checkbox"/> 1. CDM <input type="checkbox"/> 2. JI <input checked="" type="checkbox"/> 3. J-VETS <input type="checkbox"/> 4. EU-ETS
Status:	<input checked="" type="checkbox"/> 1. Lead Auditor <input type="checkbox"/> 2. Auditor <input type="checkbox"/> 3. Technical Expert
Scope of Expertise:	<input checked="" type="checkbox"/> 1. Energy industries (renewable-/non-renewable sources) <input checked="" type="checkbox"/> 2. Energy distribution <input checked="" type="checkbox"/> 3. Energy demand <input type="checkbox"/> 4. Manufacturing industry <input checked="" type="checkbox"/> 5. Chemicals <input type="checkbox"/> 6. Construction <input type="checkbox"/> 7. Transport and freight <input type="checkbox"/> 8. Mining/mineral production <input type="checkbox"/> 9. Metal production <input checked="" type="checkbox"/> 10. Fugitive emissions from fuels (solid, oil and gas) <input type="checkbox"/> 11. Fugitive emissions from production and consumption of halocarbons and sulphur hexafluoride <input checked="" type="checkbox"/> 12. Solvent use <input checked="" type="checkbox"/> 13. Waste handling and disposal <input type="checkbox"/> 14. Afforestation and reforestation <input type="checkbox"/> 15. Agriculture
Approved by:	INANAGA, Hiroshi, Chief Executive Officer of Deloitte-TECO

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